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Octyl Alcohol is a colorless liquid with a high boiling point (184.6°C.). It is only slightly soluble in water (0.14 per cent by weight at 25°C.), but is miscible with most organic substances. As a coupling and clarifying agent, Octyl Alcohol is of interest to the rubber, textile, and other industries where an agent that is effective in low concentrations is desirable.

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Being a primary alcohol, this Octanol, 2-Ethylhexanol, can be converted to octaldehyde and octoic acid—both of interest in further syntheses. It also forms esters, ethers, and amines which have greater oil solubility, higher boiling points, and lower water solubility than those made from lower carbon content alcohols. Octyl Acetate, for instance, is the principal slow-evaporating solvent used in the new lacquer emulsions to give smooth, non-blushing films.

The coupon is for your convenience in requesting further information.

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Established 1914

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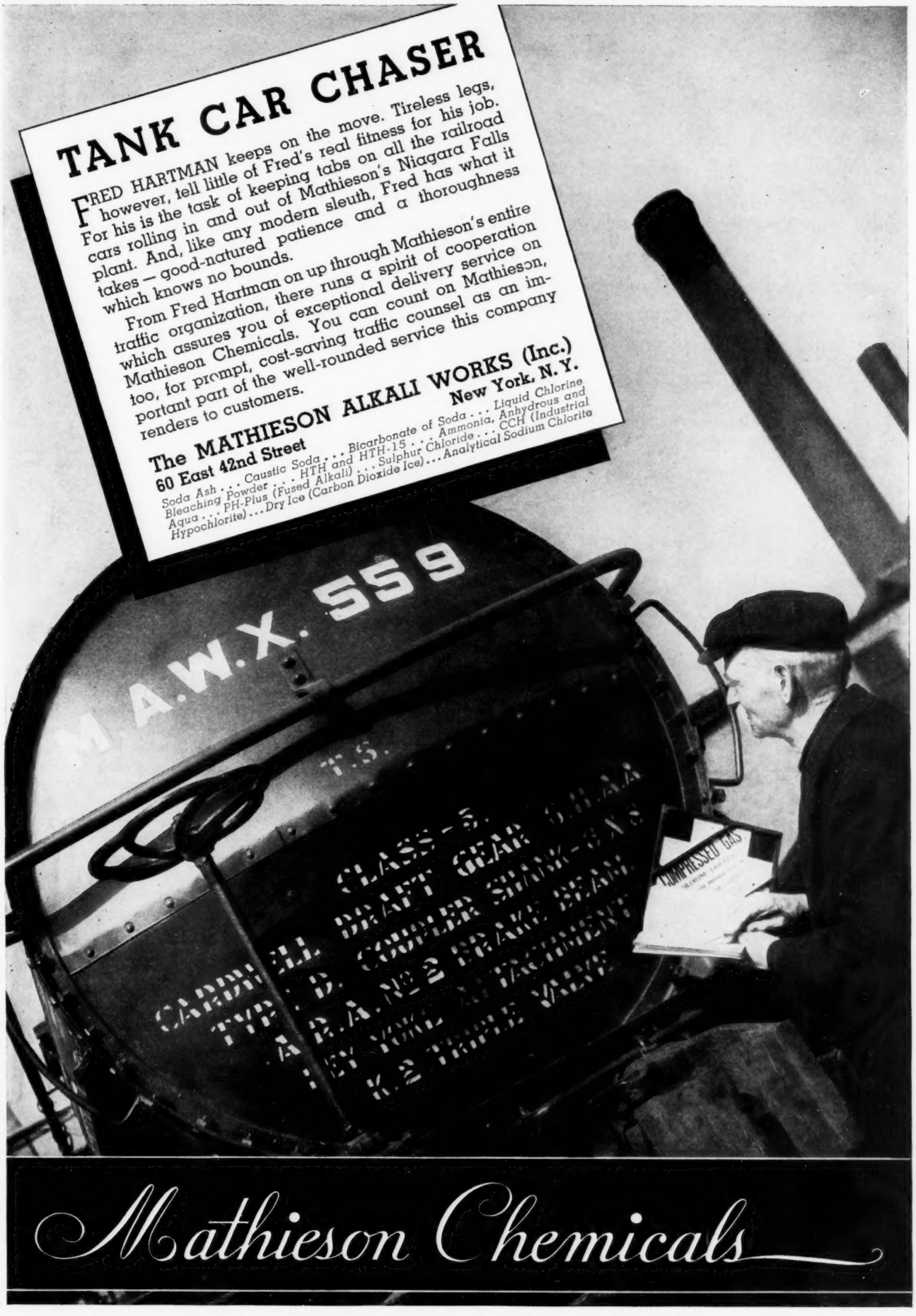
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COMPRESSED GAS
Mathieson Chemicals

The Reader Writes:—

Copywriters Attention!

I like the advertisements which give useful details about the products, such as Dow's ad on Ethocel in the November issue.

Cambridge, Mass. HOWARD A. WHITTIER

Checked for Reference

In your November 1937 issue we marked for filing the articles listed below. For the sake of simplicity they are referred to only by pages, viz., 451; 473 in general, but especially the announcement of "Actigel"; 477; 483 to 488; 489; 491 (Morpholine); 494 (an advertisement) and 496 (an advertisement). The subjects in this issue were more than unusually interesting, but we find your publication extremely interesting and worthwhile. I think perhaps that your new "State of Chemical Trade" is the most valuable feature of your publication.

Chicago, Ill. LOREN B. GRIMSLEY
The Simoniz Co.

Is This "Faint Praise?"

CHEMICAL INDUSTRIES is the most interesting of the many chemical journals I receive. It is good from cover to cover.

Detroit, Mich. CLAUDIUS NIELSEN, Pres.
Nielsen Chem. Co.

Advice From a Friend of Chemical Industry

I am glad to see your March editorial written around the new style statement analyzing profit. Your comments should draw attention to an opportunity which has been overlooked by employers.

So much propaganda has been poured out by the radical elements as to establish in the minds of the ranks of "labor" and also of the great mass of the unthinking, that throughout industry the stockholders get most of the profit and "labor" gets only the crumbs that are left. This propaganda and belief are false and yet in the face of this onslaught industry in general is inarticulate. There is an immense story of truth to be told, and it should be dramatized and presented in terms which the masses can understand.

I have reset the figures of one company so as to show the proportion of earnings distributed thus—for every dollar of income from sales—

Wages and salaries gets	33.8	cents
Depreciation and Depletion takes	3.6	"
Taxes takes	3.5	"
	40.9	"
Stockholders get	7.6	"

What an opportunity now lies before all companies to educate their employees in the truth of economics of industry in a way which they can understand. This, if properly handled, will counteract the vicious outpourings against industry and will form a basis for a better understanding and relation between capital and labor.

Private enterprise has suffered, perhaps because of lack of vision, from harsh attacks resulting in the series of restrictive and punitive legislation enacted, and with more threatened. Business and industry may not yet realize the changes which have so rapidly developed. A corporation is getting to be less personal and more public and of greatest importance is the aspect of new social and public relations.

Industry will lose a tremendous bet if it does not rise to meet this situation, take the lead in these new phases of our development and, as never before, put into this changed picture the best thought it can command. The job to be done is not in the realm of mere statistics. Is it too much to believe that in most corporations it will deserve the whole time and effort of someone of executive calibre, having a broad operating experience and who is capable of thinking in these terms?

New York City DEAN CLARK

Flowers to Harry Luce

We sort of regard your publication as the *Fortune* and *Life* of the chemical industry.

Phila., Pa. H. C. MEYER, Pres.
Foote Mineral Co.

Seeking Industrial Contacts

The soundness of your answer is without question. The thing which did, and still does, interest me is the helplessness of the teacher who intends to remain a teacher and, yet, would like to become or remain industrial minded.

If the chemistry teacher chooses to take the initiative in acquiring industrial mindedness, two suggestions are to be found in your recent symposium. He may undertake consulting work, or he may seek summer employment in a chemical plant.

The average teacher, without industrial experience is, however, hardly in a position to offer his services as a consulting chemist, or to expect those services to be sought after. If he seeks summer employment as a routine or research chemist, the chances are against him. A few may find such positions, but the industry cannot absorb any appreciable number of temporary chemists.

A great deal of work could be done on which the industrialist and the teacher might work together, but the initiative will have to come from the source of financial support. For example, the preparation of moving pictures of industrial operations, to be used in educational work, is a task which remains, for the most part, undone. The industrialists are more alert to the teaching value of carefully prepared moving pictures than is the teaching profession itself. Is there not also the possibility that small companies, from manufactory to laundry or service shop, might use the services of technically trained teachers in the preparation of sound, informative advertising concerning their product or process? The large company makes use of its own staff for that purpose. I have been trying to persuade the editor of one of the local newspapers to allow me to conduct a weekly review of applied science and inventions, but he is not yet convinced.

Of his own initiative the teacher may attend technical society meetings, visit industrial plants, and try at every opportunity to make contacts with industrial men. Hundreds of teachers are doing that much. There is not a great deal else they can do.

Tulsa, Okla. CHARLES M. LOUCKS, Ph.D.
University of Tulsa

A Glutton for Punishment

CHEMICAL INDUSTRIES talks sense in dollars and cents. I even read all of the advertisements.

Galena, Kansas SCOTT W. WALKER

ADVERTISING PAGES REMOVED

CHEMICAL INDUSTRIES

The Chemical Business Magazine

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Williams Haynes, Publisher and Editor; A. M. Corbet, and W. J. Murphy, Associate Editors; W. F. George, Advertising Manager; D. O. Haynes, Subscription Manager; J. H. Burt, Production Manager.

Two Tariff Tricks

OUR reciprocal trade treaties are being rapidly expanded into a drastic, thorough-going tariff revision downward by the means of two subterfuges which escape any but a very careful study of the rates successively put into effect as each international agreement is signed. The means employed are "the most favored nation" clause and a peculiar interpretation of the meaning of "50 per cent. reduction from the existing tariff rates." Neither of these important points is so clearly understood, even in the chemical industry, as it should be.

With the exception of Germany, any and all tariff concessions made in a reciprocal treaty with one nation become immediately and automatically effective with all others, including Japan, Italy, and Mexico. Thus, a particular tariff concession entered into, say with Belgium, in exchange for a definite trade benefit, applies to all countries even those who have made no corresponding concession and whose industrial equipment, raw materials, labor costs, and political position may all be at variance with the conditions under which the original concession was negotiated.

Under the law no reciprocal trade agreement may lower any tariff rate by more than 50 per cent., and it has been generally assumed that the base would be the Tariff of 1930. But by interpreting the law to mean that this 50 per cent. reduction may be made from the tariff rate actually in effect when each new trade treaty becomes effective, the Attorney General has put into the hands of the Secretary of State the power of successive one-half rate reductions that at the second step mean a 75 per cent. reduction from 1930 rates, and at the third step 87½ per cent., or one-eighth of the original rate.

This progressive rate cutting, combined with the generalization of all rates through the most favored nation clause, is very quickly, if not very noticeably, putting the United States into a tariff-defenseless position at the very time when by import duties, embargoes, and money control every industrial nation in the world is vigorously practicing intensive nationalism.

Raw Materials from Mexico

If our Ambassador to Mexico was really as surprised by the "nationalization" of the petroleum fields as he gave out to the press, he must be deaf and blind, for winter tourists have brought back common gossip that forecast the taking over not only of the oil lands, but also of the mines. This exploit in international brigandage has been the toast of the Mexican cafes for months. It has been gleefully boasted that the present American Government would lift no finger to defend the property rights of its citizens who happened to be stockholders in the oil companies. It has been boldly forecast that once our own petroleum reserves begin to fail, we shall be forced to pay Mexico handsomely for crude oil. It is all quite simple, completely logical, and utterly beyond the pale of law and morals. The naivete of the Honorable Josephus Daniels no doubt adds greatly to the gaiety of all Latin America, but it does not add to our prestige. Being a dupe is not the way to play the part of the good neighbor.

Fair Play to Industry

Since it was initiated by Governor Richard Leche a little over a year ago, Louisiana's policy of fair-play-to-industry has brought to the state over $47,000,000 worth of new industrial construction. This means employment for the people and the resources of the state unmeasurable in dollars, and we are proud not only that more than half this new investment is due to the lime, timber, petroleum, salt, and sulfur raw materials, all chemical resources, but also that strictly chemical enterprises have contributed some $6,000,000 in new and expanded plants to Louisiana's industrial growth. Solvay Process, Ethyl Gas, Freeport Sulphur, and Mathieson Alkali are familiar names prominent in this expansion. Louisiana bids fair to become a most important chemical headquarters.

The 10-year property tax exemption is a feature of the Louisiana plan, but Governor Leche has emphasized repeatedly that "immunity from political harassment" and assurance of fair treatment have been more compelling influences than the tax exemption in attracting new enterprises and in encouraging existing Louisiana industries to undertake expansion. The sulfur company's cooperation is a most convincing example of Louisiana's ability to win confidence, for it has undertaken a new construction and increased production program at the request of the State Board of Commerce and Industry. This request, last September, was accompanied by the board's assurance that the disparity between the $2 per ton Louisiana severance tax on sulfur—raised from 60 cents in July, 1936—and $1.03 Texas tax would be "dealt with fairly at the next session of the legislature."

That session convenes next month, and we hope Louisiana will use this conspicuous opportunity to make good its appeals, thus far so successful, for industry's confidence in the state's good faith. Sulfur is so important a raw material that this issue concerns most of the new industries in her boundaries and the legislature's handling of this tax can build up or tear down the state's promising industrial development.

A 300 Million Pound Market

The Farm Chemurgic Council is moving its meeting this month from Detroit out to Omaha in the heart of the Corn Belt, which was no doubt politic; but we hope that in 1939 they will foregather down South in the land of cotton and of long leaf pine, of tung trees and the sweet potato. For pulp from southern pines is to date the outstanding chemurgic triumph; and oil and starch appear to us to be their greatest opportunity for joint service to farm and factory. Certainly no agricultural section is more sorely in need of practical aid, for the Southeast's staple crop of cotton is more dangerously beset by economic, entomological, and political enemies than corn or wheat. Furthermore, we are today bringing in from abroad $112,000,000 of vegetable oils and $300,000,000 of starch. Here is indeed a vast, ready-made market that requires no law to create it and little propaganda to develop it, that conflicts with no other American raw materials, that cannot be supplied by synthetic substitutes.

A good start has been made. Already over 100,000 acres are planted with tung trees, and the experimental sweet potato starch plant in Mississippi last season produced over 100,000 pounds before it had to close down for lack of raw material. Just as tung oil has its own premium markets in the paint industry, so sweet potato starch is favored in the textile mills because of its lasting adhesion to fibres. In this industry alone normal consumption is some 100,000,000 pounds, at a recent average price of 3c.

Threat or Promise?

PHOSPHATES

By Williams Haynes

PHOSPHATES have suddenly become exceedingly important. By an interesting transformation they have usurped the position traditionally held by the nitrates with all of the chemical, agricultural, and political implications that this, in these days, involves.

First of the vital elements of plant food to be developed chemically, superphosphates have long been the chief chemical activity of the fertilizer industry, and because we have always been the world's largest producer of phosphate rock and the phosphate mines have been operated mainly by the larger fertilizer manufacturers, this material has had a unique economic importance for the American chemical industry during the past half century.

Now, just when private enterprise has, for the first time in chemical history, made available here abundant commercial supplies both of pure phosphoric acid and of elemental phosphorus, these chemicals have apparently become obligatory products of the Government's power program. Accordingly, at the very moment when a notable development in new phosphorus processes and new phosphorus compounds of great use to industry is forecast, an untried factor in chemical economics becomes forcefully effective.

Of TVA Origin

The present unmatched situation stems from the decision of the TVA, under the chemical direction of Dr. Harry A. Curtis, to produce, not nitrates, but phosphates. Because he was a thoroughly competent nitrogen authority, Dr. Curtis realized that since the War we had declared nitrogen independence with available domestic supplies adequate for agriculture or in event of war. Accordingly, he adopted the proposal of the Muscle Shoals Commission of 1931, appointed by President Hoover and representing jointly Alabama, Tennessee, and the United States, and started the production of phosphoric acid for the manufacture of triple superphosphate. Much experimental work has no doubt been done both with coke and electric furnaces. Considerable phosphate deposits have been bought in Tennessee. Both triple superphosphate and metaphosphate have been produced.

The chemical-economic facts of this project have been much less publicized than the political-agricultural propaganda, but the original proposal was to manufacture 120,000 tons of phosphoric acid (P_2O_5), which in the form of triple superphosphate would replace 1,125,000 tons of ordinary 16% material. Our average annual production of superphosphates from 1926 to 1930 was 4,333,000 tons.

U. S. Superphosphate Short Tons; Based on 16% Available Phosphoric Acid

Year	*Production*	*Estimated Consumption*
1910	2,875,000	2,875,000
1913	3,145,000	3,134,000
1916	3,019,000	3,019,000
1919	3,273,000	3,175,000
1920	5,349,000	5,258,000
1921	2,362,000	2,357,000
1922	2,787,000	2,757,000
1923	3,366,000	3,319,000
1924	3,249,000	3,198,000
1925	3,845,000	3,771,000
1926	3,797,000	3,725,000
1927	4,350,000	4,275,000
1928	4,540,000	4,510,000
1929	4,400,000	4,370,000
1930	4,649,000	4,413,000
1931	2,812,000	3,487,000
1932	1,850,000	2,237,000
1933	2,812,000	2,576,000
1934	3,040,000	2,830,000
1935	3,250,000	3,085,000
1936	3,850,000	3,850,000

At the time this Muscle Shoals program was set up, the fertilizer industry without building a single new plant could have produced seven million tons. In its last annual report, TVA gave its production to June 30, 1937, as 34,000 tons of 45% superphosphate, contributed for demonstration purposes on 22,720 farms, scattered throughout 33 states and used by the Agricultural Adjustment Administration under the Soil Conservation Act.

In the meantime, TVA officials have announced a new process for the production of a 63% superphosphate, and the impression has been broadcast that the Authority has made available for the first time new, concentrated phosphorus plant foods. As a matter of fact, triple superphosphate has been manufactured in the United States by the Virginia-Carolina Chemical Corporation for thirty-one years. It has long been well

known to the fertilizer trade which has used it extensively in the production of high-test plant food.

Triple superphosphate has been produced by the so-called wet process of the Virginia-Carolina Chemical Corp. and the American Agricultural Chemical Co., both of whom have recently made electric furnace installations to produce phosphorus and phosphoric acid. The wet process is operated by the U. S. Phosphoric Products Corp. at Tampa, Fla., by the Armour Fertilizer Works at Columbia, Tenn., by the Anaconda Copper Mining Co. at Anaconda, Mont. The Victor Chemical Works have a coke furnace plant at Nashville, and are building a new electric furnace. The Monsanto Chemical Co. in Tennessee and the Phosphate Mining Co. in Florida have both new electric furnace installations.

Six firms report that they are today actually in production of triple superphosphate and present capacity of private manufacturers is estimated by the National Fertilizer Association to be in excess of 150,000 tons. Probably not half of this output is now in actual production. The problem has long been, not to make high-test fertilizer phosphate efficiently and cheaply, but to induce the farmers to use it.

"The Modest Legume"

Of late, the TVA has been broadcasting a novel theory of plant food utilization. In rationalizing their phosphate program they announced: "The production of nitrate fertilizer would have been contrary to the Congressional mandate to improve, increase, and cheapen the production of fertilizer and fertilizer ingredients since no chemical nitrogen plant could compete in efficiency with the modest legume." In other words, liberal applications of phosphates plus frequent rotations of leguminous nitrogen-fixing crops, is the true solution of the soil fertility problem. Even if practical from the cultural point of view, such practice would appear to be fantastic from any economic consideration, and it runs counter to age-old experience.

During the past six months, however, the center of phosphate interest has been shifting to the western deposits where a repetition of the Muscle Shoals experiment is proposed, first as an outlet for the power from the hydroelectric plants built by the Government in the Northwest, and second, to provide western agriculture with abundant supplies of phosphate at low cost. Friends of the Administration's power program, a versicoloured group that ranges all the way from bright red baiters of utility companies to lily white conservationists of our national resources, have all joined in spirited opposition to any public airing of the internal workings of TVA. The reason is plain. For, if downright dishonesty were not developed, the facts revealed would dangerously damage the "Seven Little TVA Bill" introduced by Senator Norris and Representative Mansfield.

This so-called Mansfield Bill has substantially the same objectives as the TVA Act. It sets up, however, planning agencies, directed to study projects and activities intended to accomplish the purposes of the law. The TVA Act, on the other hand, organized an action agency, which in its fertilizer activities is authorized:

to contract with commercial producers for the production of fertilizer or fertilizer materials as may be needed in the Government's program of development and introduction in excess of that produced by government plants;

to arrange with farmers and farm organizations for large-scale practical use of new forms of fertilizers;

to cooperate with experiment stations and demonstration farms for the use of new forms of fertilizer or fertilizer practices;

to manufacture and sell fixed nitrogen, fertilizer, and fertilizer ingredients;

to make donations or sales of the products of its plants through county demonstration agents or otherwise for experimentation and introduction of the use of such products in cooperation with practical farmers;

to alter existing plants and facilities and to construct new plants;

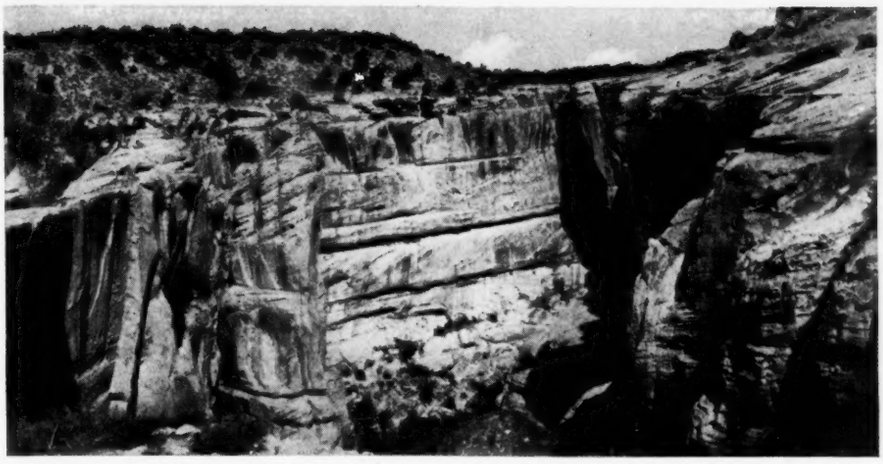
to maintain and operate laboratories and experimental plants and to undertake experiments for the purpose of enabling the corporation to furnish nitrogen and other fertilizer products for agricultural purposes in the most economical and efficient manner.

In view of the proposal to extend the scope of similar activities throughout seven different regions of the country, it is important that these defined activities of the TVA be studied carefully. And it may be extremely interesting to have them in mind during any investigation of what the TVA directors have done or omitted to do during the past four years.

"Waste, Silly Management, Star-gazing"

Quoting an anonymous "insider friendly to the TVA," Alfred Krock, correspondent to the *New York Times,* himself sympathetic to the Administration, explained why the President and his friends were so eager to forestall a TVA exposé: "A Congressional investigation, no matter how friendly to the Administration the chairman tried to hold it, would show waste. It would reveal instances of foolish and even silly management. It would uncover some of the tallest star-gazing you ever read about. People would laugh at the management of TVA, even though the provocation of that laughter would be minor in comparison with the good work shown." Ridicule, as Krock points out, is an extremely effective weapon politically, and the special significance of TVA has been indicated by Dr. Arthur D. Morgan himself in an article published in the *Manufacturers Record* (Oct., 1933) when he stated: "The President wanted somewhere an undertaking that was not an emergency, but a deliberate social planning for the future. The Tennessee Valley Authority is an expression of that desire."

Now the western phosphate deposits have become linked to the Government's power program, as a means of taking up vast surplus power to be created at the Bonneville and Grand Coulee dams. At Bonneville,



"Over a mountainous terrain"—the site, fourteen miles from Vernal, Utah, where the Humphreys Phosphate Company is planning to build a plant—typical of the rough country in the heart of which are situated the Western phosphate beds.

a capacity of 432,000 kilowatts is being constructed, and in a few months 42,000 kilowatts are to be generated in two of the projected ten units. This gives a contemplated capacity of 2,332,000 kilowatts, produced in a territory (Oregon, Washington, Montana, and Northern Idaho) for which the all-time record of electrical consumption, in September, 1937, is only 1,100,000 kilowatts. Today there is an available capacity of 1,600,000 kilowatts from the utility companies in this territory where there is already a high individual private consumption at rates close to the very lowest in the United States. To justify an estimated expenditure of $394,000,000 at Grand Coulee, and $35,000,000 at Bonneville, a big industrial power consumption must be developed, and so the proposal is made that this power be turned into the phosphate fields. These phosphate deposits lie about 600 miles airline from Bonneville and some 550 miles airline from Grand Coulee, across a mountainous terrain over which either shipment of rock to the power plants, or transmission of power to the mines, is extremely costly.

Transmission of electrical power further than four hundred miles has heretofore been regarded as economically prohibitive. The transmission lines from Boulder Dam to Los Angeles, a distance of 270 miles, with substation facilities, cost $26,000,000, an average of $97,500 per mile. On this basis the cost of transmission lines from Grand Coulee or Bonneville to southeastern Idaho would be about $60,000,000 each. If 150 kilowatts could be delivered, the average cost of the transmission lines would be close to $400 per kilowatt. If we use the TVA figures of Harry Curtis who has reported production of superphosphate at Muscle Shoals at an expenditure of 2,220 kilowatt hours per ton, at a cost of 2.8 mills per kilowatt hour, or a total power cost per ton of $6.00; fixed charges on proposed transmission lines alone would thus be $8.60 a ton for phosphate produced.

At a press conference early in March, just before the TVA controversy broke into the open, President Roosevelt disclosed that he would shortly send an informative message to Congress on the subject of phosphates. When this announcement was made (the phosphate message has not been made public at the time of this writing) it was intimated that not only is a world phosphate shortage impending, but also that certain foreign countries are deliberately drawing upon American supplies to conserve their own reserves.

Estimates of known deposits of phosphate rock in the United States, of a grade suitable for superphosphate manufacture by present methods, are sufficient to last, at present rates of production, for two thousand years. The latest figures are from the report of the Joint Committee of the Land Grant Colleges and the Department of Agriculture (Oct., 1936) as follows:

U. S. Phosphate Rock Reserves

State	*Long Tons*
Florida	546,000,000
Tennessee	103,000,000
South Carolina	10,000,000
Kentucky	1,000,000
Arkansas	20,000,000
Idaho	5,000,000,000
Montana	392,000,000
Utah	237,000,000
Wyoming	116,000,000
Other States	90,000,000
Total	6,515,000,000

Furthermore, it should be noted that a potent extender of these phosphate deposits of ours has been introduced by private industry in the development of the flotation process for the extraction and dressing of phosphate rock. Commenting on this process the same report says: "With the application of improved recovery methods, such as the flotation process, allowing the use of lower grade rock, the domestic supplies of marketable phosphate rock can be increased greatly beyond the figures in the preceding table. In the tabulated figures, only those for Florida and Tennessee are based on the use of the flotation process for the recovery of the phosphate."

The world's known phosphate deposits are, according to the same authority, not quite three times the total for the United States:

World Phosphate Rock Reserves

Location of Deposit	*Long Tons*
United States	6,515,000,000
Europe	5,891,200,000
Africa	3,637,100,000
Asia, including Japan and Mandated Islands	37,100,000
Island deposits	155,900,000
Australia	400,000
South America	1,000,000
Mexico	211,100,000
Canada	181,000
Total	16,448,981,000

For a number of years past, although domestic consumption has fluctuated rather sharply while exports have remained comparatively steady, we have been producing roughly some 3,000,000 tons of phosphate rock and exporting about a third of our output. The detailed figures for the past two decades are as follows:

Year	*Production*	*Exports*	*Available for Domestic Use*
1919	2,271,983	378,731	1,893,252
1920	3,975,001	1,069,712	2,905,289
1921	2,426,174	733,312	1,692,862
1922	2,336,856	719,294	1,617,562
1923	2,943,566	827,551	2,116,015
1924	2,845,303	818,773	2,026,530
1925	3,253,671	870,200	2,383,471
1926	3,592,022	748,963	2,843,059
1927	3,127,655	918,211	2,209,444
1928	3,523,356	898,764	2,624,592
1929	3,787,255	1,142,746	2,644,509
1930	4,036,197	1,225,722	2,810,475
1931	2,666,509	951,305	1,715,204
1932	1,698,148	613,035	1,085,113
1933	2,359,635	829,059	1,530,576
1934	2,898,238	993,493	1,904,745
1935	3,159,328	1,104,394	2,054,934
1936	3,462,837	1,208,951	2,253,886

Minerals Yearbooks.

Moreover, although our exports have been growing steadily since 1932, we have not held our comparative position in the world's phosphate trade. Even at that time it was forecast (*Chem. Ind.*, Nov. '31, p. 461) that our dominating supremacy of the international market was seriously threatened. How truly this prophecy has been fulfilled is shown by comparing American exports with the shipments from the other chief world sources in the following table:

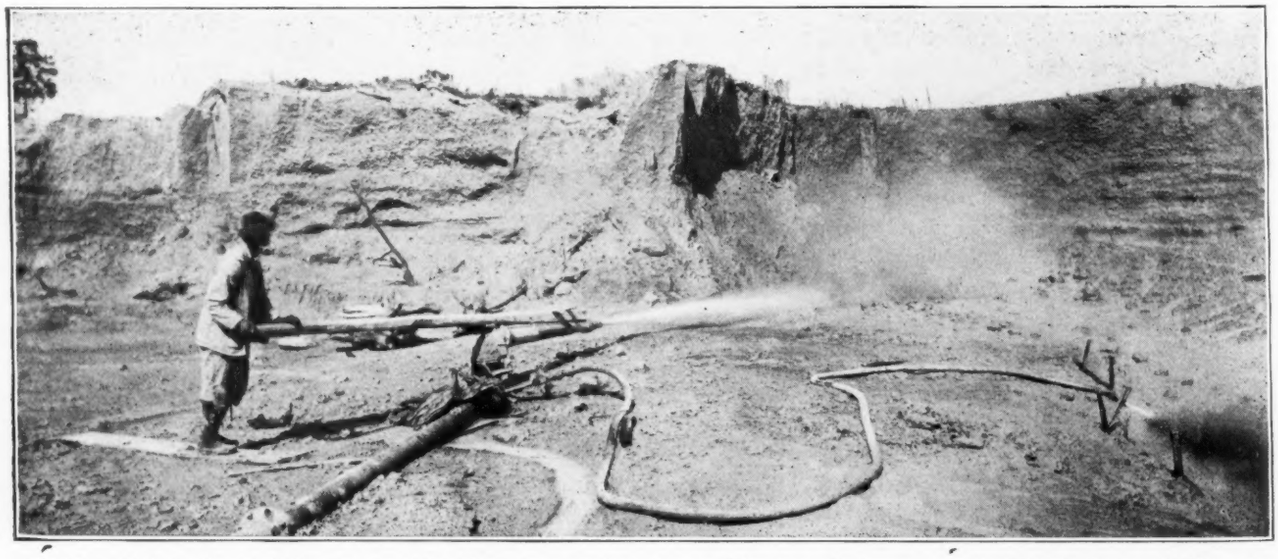
Shipments from World's Principal Sources
Metric Tons

Year	*North Africa (French)*	*Egypt (Italian)*	*Islands in Pacific (British)*	*Russia (Exports only)*	*Japanese Islands*
1931	3,222,533	156,502	381,620	2,720	44,685
1932	3,249,275	327,839	624,896	87,879	79,023
1933	3,489,535	368,914	558,043	283,453	103,155
1934	3,707,696	341,016	640,283	389,997	105,882
1935	3,369,873	332,365	720,395	377,205	166,856
1936	3,538,990	367,789	965,771	497,726	199,894
1937	4,064,512*	322,259	1,104,400	584,739	234,400

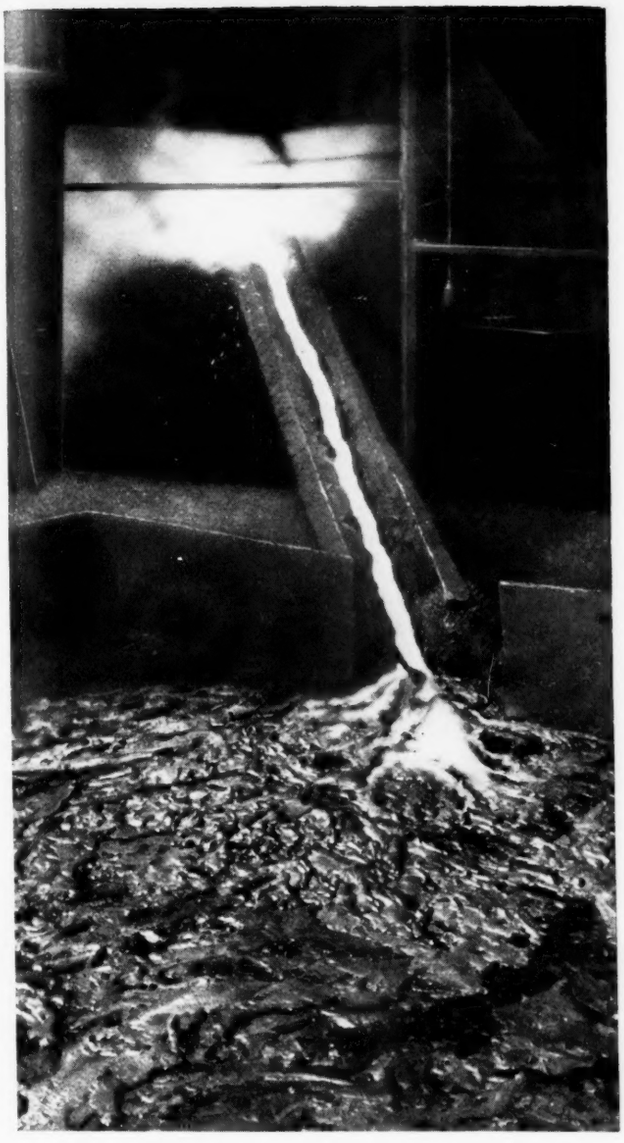
* Preliminary figure subject slight correction. From Phosphate Export Association.

These figures certainly do not indicate that any of the foreign countries are holding back rock production and importing from us in order to save their reserves over against a coming phosphate famine. Indeed, the world's phosphate producers have all been struggling manfully to increase their own share of the world's business. Production has been greater than consumption almost chronically, nevertheless, each country for diverse reasons has been keenly anxious to raise its own phosphate output and sales.

The big growth in Russian exports of phosphate is most impressive, for beside the exports shown above, Russia has increased production for domestic consumption enormously. It is estimated that in 1931 she produced about 300,000 tons which were consumed in Russia, while in 1937, her domestic consumption is estimated at over a million tons which, plus exports,



Florida, which produced eight and one-half million tons against three million for all the rest of the United States (1936), *gets out pebble rock by hydraulic mining. Shipments, not only to Europe, but to Baltimore, the world's biggest phosphate producing center, or even to the West Coast, are made more cheaply than from Tennessee, or the Western beds.*



Five producers are offering pure phosphoric acid and elemental phosphorus, produced by thermal methods, at the time that the Government is apparently going to propose an extension of the Muscle Shoals blast furnace plants in connection with the Bonneville and Grand Coulee power developments. Photograph represents elemental phosphorus from an electric-furnace in an American Agricultural Chemical plant.

means that she produced in 1937 1,600,000 tons against 300,000 tons in 1931.

In the French territory of North Africa, shipments from Algeria and Tunisia have shown little change, having been 2,322,000 metric tons in 1931 and 2,550,000 in 1937. Shipments from Morocco, on the other hand, have steadily increased from 900,000 metric tons in 1931 to 1,514,000 in 1937. Morocco phosphate is of higher grade and the world demand is more and more for the high grades. The Algerian-Tunisian deposits are owned and operated by private capital while the Moroccan mines are operated and their product sold by the Moroccan Government, a protectorate of France. They are financed through a loan by the Government, their expenditures are carried by the Government, and the Government receives the net proceeds.

Italy consumes only little of the phosphate produced from the Italian owned mines at Kosseir, Egypt (44,521 metric tons in 1937), but the Italians are working their deposits to full capacity and making every effort to secure the greatest possible share of the Japanese business. Here they obtain a better price for their product because of comparatively low ocean freight rates from the Red Sea to Japan. On shipments of Kosseir phosphate to Italy or other European countries, Suez Canal dues have to be paid, but vessels for Japan do not have to pass through the Canal. In 1937, shipments of Kosseir phosphate to Japan amounted to 204,731 metric tons compared with 71,400 shipped to Japan in 1931.

While the meager Japanese phosphate reserves are sufficient only for a comparatively short time, the Japanese are nevertheless straining to increase production to reduce the quantities they have to import from American and other sources. They are said to be making a great effort to double their 1937 production this year.

The phosphate deposits of Ocean and Nauru Islands in the Pacific are owned and operated jointly by the British, Australian, and New Zealand Governments and their product sold at cost in these three countries. Whatever surplus they have above these needs is sold to other nations, chiefly to Japan.

"A Thousand Years in Thy Sight"

In all this frantic scramble for the world's phosphate markets there is little hint of concern over a threatening shortage of supplies. Obviously phosphate consumption is expanding. Even in this country, where our fertilizer manufacturers have naturally tended to push superphosphate sales by loading mixed fertilizer formulas with this element more heavily than is the practice abroad, there is little doubt but there has been a steady depletion of phosphate in all strongly cropped soils. Not only is this agricultural deficiency to be corrected, but the industrial use of phosphorous compounds is beginning to grow and may naturally be expected to expand further.

However, improved mining technique (notably the flotation process mentioned above) is already able to double recovery and thus double reserves so as to care for a double consumption. Only a very pessimistic chemical man would be willing to believe that within the next thousand years we could find no way to recover the lost or waste phosphates in garbage and sewage so as to replace the quantities of this element taken from the soil by plants. Even so gloomy an outlook presupposes that no new phosphate deposits will be discovered or no substitutes developed for the present uses of phosphorous compounds in sugar refining, rust-proofing, silk weighting, galvanizing, fire-proofing, and even in self raising flour and medicines.

Superphosphate statistics for current fertilizer year will be found in the Data Section (Pt. 2—blue sheets).

"DANGER!—Flammable Liquid"

By G. Klinkenstein

Vice-President and Technical Director, Maas & Waldstein Company

FLAMMABLE liquids stand high in the list of the chemical industry's fire hazards. Though harmless as liquids, their vapors become combustible or explosive when mixed with certain proportions of air, and fires fed by them are particularly difficult to fight and subdue. Even small quantities can cause disaster, so that the problem of providing an adequate system of fire protection arises in every plant where these liquids are used.

Among the chemical manufacturers whose very existence depends upon working out a practical solution to this problem is the manufacturer of lacquers, enamels, and other industrial finishes. The principal raw materials are a variety of alcohols, esters, ketones, and hydrocarbons, most of which are very volatile and have low flash points. Another raw material, used in large quantities, is pyroxylin, a substance which burns rapidly and gives off obnoxious and dangerous gases in the process. Obviously, not only eternal vigilance, but a well organized and efficient system of fire prevention and fire fighting, as well, is the price of safety here.

To prevent fires every precaution is taken to eliminate the causes: i.e., (1) the accumulation of vapors to the point where they become inflammable, and (2) flames and sparks.

To prevent the escape of vapors, all containers holding solvents are kept tightly closed, and all tanks and cans are kept covered except when in actual use. The plant itself is so designed that it has an excellent system of natural ventilation, and tests have never shown dangerous accumulations of vapors in any part of it. Flammable liquids in quantity are stored in underground tanks, served by a pumping system.

To prevent sparking at hazardous points, all electrical equipment—motors, controllers, lamps, switches, etc. —are of the approved explosion-proof type.

Many years ago we discovered that static electricity is developed when anhydrous liquids are pumped through pipe lines, agitated in tanks, or even by being poured through funnels. Hence all machinery, pipe lines, tanks, metal containers, cans, funnels, etc., are grounded to avoid the possibility of static sparks.

All of the tools used inside the plant, such as hammers, wrenches, rakes, and shovels, are of non-sparking bronze. All bearings are frequently inspected and kept properly lubricated, so that there is no chance of their over-heating. Rules against smoking and the use of naked flames of any kind are rigidly enforced.

Fire prevention measures are of the utmost importance, but they never can be completely effective. Neither human beings nor mechanical devices are under absolute control, and, in spite of every precaution, the unexpected may happen. Hence, under the best of conditions, there is always a possibility of fire, and means must be at hand to deal with it when it occurs.

In the Maas & Waldstein plant, there are three lines of defense against fire, and all three are promptly manned whenever a fire alarm sounds.

Hand extinguishers form the first line of defense. Hundreds of these are scattered throughout the plant. There are three, four, or more in every room, so that at no time is one more than a few feet away. Each extinguisher is of the type best suited for the duty it may have to perform, and most of them are of 2½ gallon capacity. Every employee in the plant is trained to operate these extinguishers, to assure that they will be ready for use when needed.

Forty-gallon foam-type extinguishers, on wheels, form the second line of defense. These are so located that one or more can be rushed to any part of the plant in a few minutes.

Water—and plenty of it—forms the third line of defense.

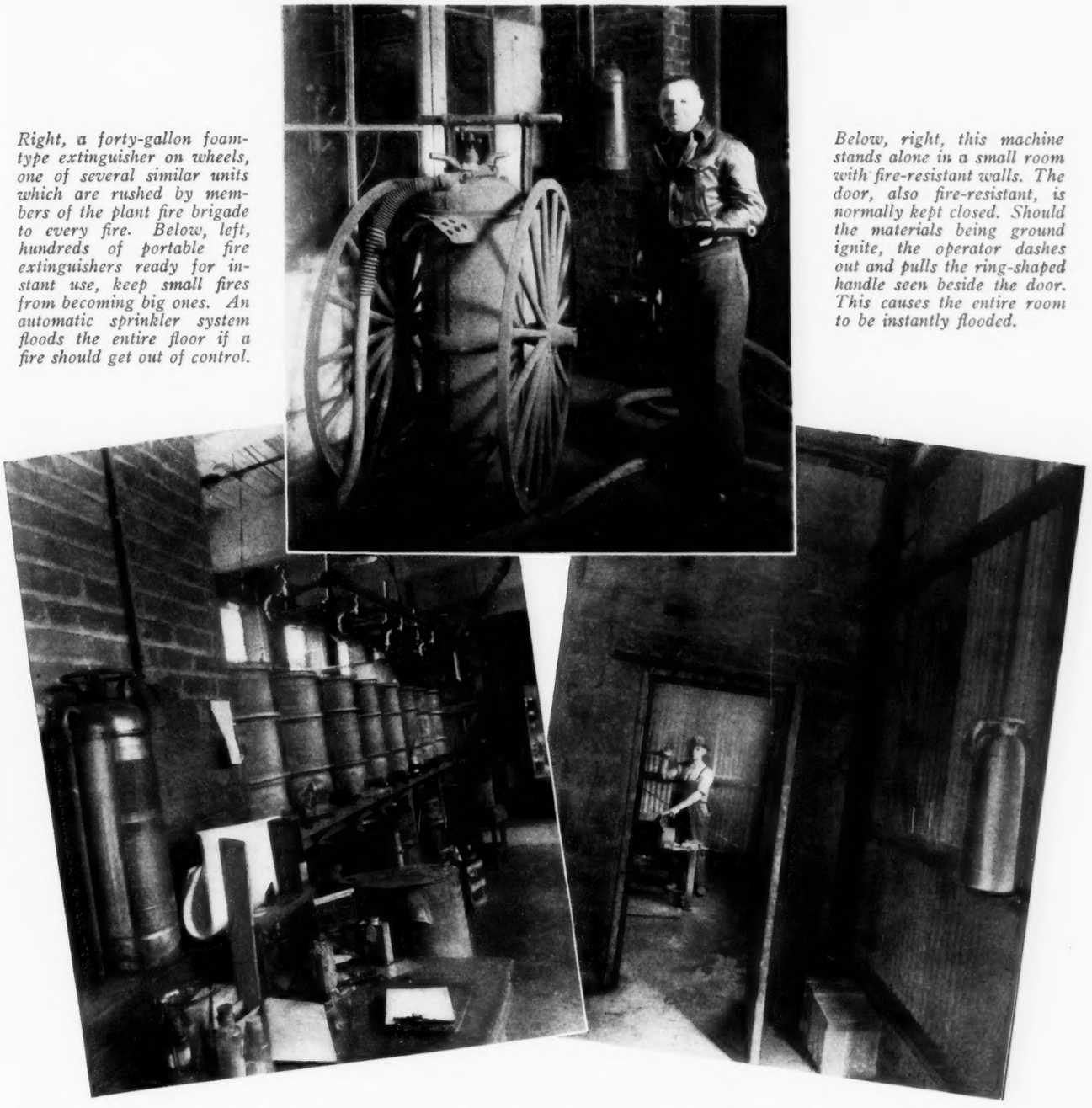
The emphasis here is on "plenty." A moderate amount of water on burning lacquer is worse than useless. It will fail to extinguish the flames, and as lacquer floats on water, the fire may be spread over a wide area. This is especially true if the burning lacquer is in a tank, and the water fills the tank to overflowing.

But a deluge of water is another matter. If so much water can be applied in a given area that it cools all parts of the liquid below the ignition point, even burning lacquer is extinguished. Tests, satisfactory to the Underwriters, demonstrated that this can be done in any part of the Maas & Waldstein plant. An automatic sprinkler system protects the entire plant; devices, by which a flood of water can be released by pulling open a quick-acting valve, are installed over all specially hazardous machines; and any point in the plant can be reached by 2½-inch hose supplied with water at 60 lbs. pressure. With this system, of course, care must be taken to prevent extensive water damage, and the plant is laid out with this object in view.

When a fire alarm sounds, a well-organized fire brigade springs into action. This brigade is under the charge of a chief, and is divided into several squads, each under a captain. There is a squad for each fire

Right, a forty-gallon foam-type extinguisher on wheels, one of several similar units which are rushed by members of the plant fire brigade to every fire. Below, left, hundreds of portable fire extinguishers ready for instant use, keep small fires from becoming big ones. An automatic sprinkler system floods the entire floor if a fire should get out of control.

Below, right, this machine stands alone in a small room with fire-resistant walls. The door, also fire-resistant, is normally kept closed. Should the materials being ground ignite, the operator dashes out and pulls the ring-shaped handle seen beside the door. This causes the entire room to be instantly flooded.



hydrant and hose reel, and one for each wheeled foam-type extinguisher.

The members of the squads are trained to handle their equipment in the most effective manner. Each one has a specific job to do, and, at the alarm, runs at once to his station. Squads that are in reach of the fire bring up their apparatus, ready for action should it be needed, and those whose stations are remote, come in and report to the chief for any duty he may assign them. In the meantime, other employees are busy with hand extinguishers.

Fire drills are held every month, and the equipment and alarm systems are inspected and tested twice a month. All extinguishers are emptied once a year and given fresh charges.

Fire alarms are sounded, automatically by the sprinkler systems, and manually from boxes located throughout the plant. When a plant alarm is sent in, the city fire department is also notified. The nearest city fire department station is about a mile away and its equipment cannot arrive in time to take part in controlling a fire in its earliest stages. The engines are always dispatched, however, in case they should be needed.

Special training in using fire extinguishers is given the watchmen who make complete hourly rounds of the plant at night. These watchmen operate key stations which are wired to the American District Telegraph Company headquarters where their rounds are recorded and controlled.

One of the most important safeguards at this plant is the fact that all employees fully understand that a serious fire may deprive them of their jobs. In consequence, the full cooperation of all in carrying out safety regulations is secured.

Types of Extinguishers Approved by Underwriters for Flammable-Liquid Fires

Portable Extinguishers—For Incipient Fires

Type	*Charge*	*Operation*
Foam	Two solutions 1. Sodium bicarbonate plus foam stabilizer 2. Aluminum sulfate	For operation, the two solutions are mixed, causing precipitate of aluminum hydrate and evolution of carbon dioxide. A voluminous, fire-resistive foam is formed, which is forced out of extinguisher by gas pressure and smothers fire.
Vaporizing liquid	A special non-conducting liquid, with a carbon tetrachloride base, with important components for depressing the freezing point, avoiding corrosion, etc.	Liquid is pumped, or forced out by stored gas pressure, on to fire. It vaporizes and, vapors being 5.3 times heavier than air, they form a blanket that displaces air.
Carbon dioxide	Carbon dioxide at pressure of 800 to 900 lbs. per sq. inch	Gas is released and blankets fire.
Dry chemical	Moisture-proofed sodium bicarbonate in dry powdered form	Powder is forced out by pressure of stored inert gas.
Loaded stream	Concentrated solution of alkali salts of unrevealed composition	Effective on certain small flammable liquid fires, but exact action is not understood.

Fixed Systems

Type	*Operation*	*Applications*
Foam	Large fixed units containing foam-forming solutions operate on same principle as portable units; or foam-forming chemicals in powder form may be fed into water pipe line.	Useful for protecting many hazards, especially large tanks of flammable liquids. Not suitable for use on tanks of alcohol, carbon disulfide, or acetone.
Carbon dioxide	Carbon dioxide, stored in standard cylinders, is released.	For flooding rooms and other enclosures, and open tanks.
Inert gas	Gas (which may be cooled and conditioned flue gas, carbon dioxide, or nitrogen) is fed to hazard continuously.	For preventing fire and explosions in ovens and other enclosures where operations, highly hazardous in air, are being carried on.

In fixing the insurance rates on this plant the Underwriters allow the credits for the following protective measures—extinguishers, sprinkler system, company fire department, and ADT watchmen's system.

Flammable Liquids Used in the Manufacture of Finishes and Their Approximate Flash Points

Alcohols

Methyl alcohol	1 to 32° C.
Ethyl alcohol	9 to 32° C.
Denatured alcohol	5 to 17° C.
Fusel oil	42° C.
Butyl alcohol	23 to 44° C.

Esters

Ethyl acetate	below 0° C.
Butyl acetate	25° C.
Amyl acetate	44° C.
Butyl propionate	33° C.
Diethyl phthalate	120° C.
Dibutyl phthalate	165° C.
Ethyl lactate	47° C.

Ketones

Acetone	below 0° C.
Diacetone alcohol	6 to 35° C.

Glycol ethers

Cellosolve	40° C.
Cellosolve acetate	47° C.

Hydrocarbons

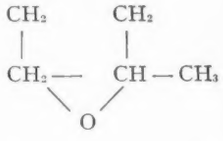
Benzol	27 to 10° C.
Toluol	2 to 13° C.
Xylol	35° C.
Benzine	below 0° C.
Solvent Naphtha	21 to 28° C.

U. S. Copper Industry in '37

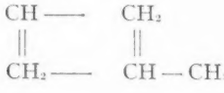
The U. S. copper industry showed improvement for the year '37 as a whole in regard to production, deliveries and price, according to the Bureau of Mines. Following record-breaking demand, falling stocks and rapidly advancing prices late in '36 and early in '37, the production rate was advanced sharply. Domestic production overtook domestic deliveries in May and from then until the end of the year producers' stocks of refined copper increased monthly, with the promise of a continuance of this trend into '38.

Furfural in Synthetic Rubber

Interesting possibilities in use of furfural as a raw material for synthetic rubber are suggested by a new process (Fr. Pat. 811,695). Hydrogenation of furfural under certain conditions gives an exceptionally high yield of tetrahydromethyl furane



which readily splits off water to give piperylene



The latter substance (b.p. 42° C., sp. gr. 0.679) can be polymerized to a rubber-like product by the usual methods practised for the butadiene family of synthetic rubbers now in production in various countries (*e.g.* by warming in presence of sodium wire). Since furfural is at a very low price, the process may well lead to a considerable expansion in its use. According to the specification, outlined in *Chemical Age*, Jan. 15, '38, p. 49, the hydrogenation of furfural is concluded in two stages; the first (in presence of a copper catalyst) yields methyl furane and the second (in presence of a reduced nickel catalyst at a low temperature) completes the hydrogenation of the furane ring to tetrahydromethyl furane in 85 per cent. yield. Conversion of the latter to piperylene (in 90 per cent. yield) is effected by passage over aluminum phosphate which has been calcined at 350° C.

New Applications of Glycerine

By Georgia Leffingwell, Ph.D.

and Milton A. Lesser, B.Sc.

PATENTS are tangible evidence of the practical value of research. An idea that has commercial value is, as a rule, patented for protection. Therefore, when it is desired to review actual new applications of a substance, one naturally turns to these registered records. Outstanding among the materials that continue to find new, diversified uses will be found the versatile fluid, glycerine.

The unique properties of glycerine make it invaluable in a constantly growing number of chemical specialty preparations. Reviewing briefly the physical properties of glycerine which adapt it to such diversified usage, it is a clear, viscous, hygroscopic fluid, with a very low freezing and a high boiling point. It is heavier than water, with which it is fully miscible, as it is with alcohol. Glycerine does not mix with benzene, ether, chloroform and most oils.

The chemical properties, too, are assuming greater importance. The fact that glycerine ($C_3H_5(OH)_3$) is a polyhydric alcohol has opened a wide vista for its use in manufacturing alkyd resins. In combination with polybasic materials such as phthalic acid or anhydride, with or without modifying agents, it has become a major ingredient in numerous modern synthetic resins and plastics. Glycerine derivatives, such as polyglycerol and certain glycerine esters, are finding many uses. A study of the patent literature of only the last two and a half years reveals many new glycerine utilizations.

Glycerine and its chemical modifications are becoming important emulsifying and dispersing agents, of great value for a host of purposes. Polyglycerols are obtained by polymerizing glycerine with alkali catalysts under suitable conditions. These polyglycerols are esterified and the polyglycerine esters find use as antispattering agents for margerine, and as emulsifying agents, particularly for edible products (13). Another glycerine preparation is described as a "detergent, wetting, antispattering, emulsifying and frothing agent" (14). The same worker who produced the foregoing invention also prepared an emulsifying agent containing fatty acid esters of polyglycerols. Polyglycerine mixtures are obtained from glycerine and an excess of these polyglycerines is made to react with higher fatty acids such as those of coconut oil or the like. The products so obtained may be used in the preparation of cosmetic creams, shaving preparations, detergents, insecticides, and the like (15). A series of Swiss patents (16) covers a group of cleaning, washing, emulsifying and dispersing agents. These are made by treating oils such as olive, coconut, castor and the like with a mixture of sulfuric acid and glycerine esters of the same acid. Another series similarly covers the use of animal oils. Under specified mechanical conditions, a mixture of glycerine and water acts as a dispersing medium for insecticides, pigments and other substances (17).

Growth of the application of electricity has found glycerine keeping pace, particularly in electrical insulations. Here the alkyd resins find varied uses. An alkyd resin is used to bond or unite cotton, silk, asbestos, glass or paper to enameled insulating conductors (18). Typical of the alkyd resins used in making electrical insulators is the following formula (19):

Glycerine	20.0 per cent.
Phthalic anhydride	46.6
Castor oil	26.7
Ethylene glycol	6.7
Metallic driers	as desired

In the insulated coverings of electrical wires, the wire is covered with wool fibres, treated with glycerine, and then impregnated with a moisture-proof material such as asphalt. This is further treated with mica dust and sheathed with asbestos fibres to render the setup fireproof (20). It also acts as a bonding agent for highly pulverized materials used in making enameled insulated carriers (21).

Although glycerine has long been known as an ingredient of pipe gaskets and packings, a few recent developments should prove interesting. Oil proofed gaskets may be made by saturating fabric with a smooth mixture of solutions of gum arabic, starch and glycerine in equal proportions (22). Another patent describes a paste for use on engine gaskets. This mixture may also be used as a lubricant. It consists of 40 per cent. heat-treated hot- and cold-pressed castor oil, 50 per cent. soft soap and 10 per cent. glycerine (23). Joint packings for pipe flanges and the like are made by mixing finely ground cork flour with a gelatinous binder made of glue and glycerine (24).

Cellulose products utilize large quantities of glycerine. Cellophane manufacturers consume a substantial proportion of the glycerine produced in this country. A cigarette wrapper made of regenerated cellulose contains glycerine among the several ingredients used (25).

A novel cord for tying packages is made by covering a core of cotton cord with strips of colored Cellophane. The Cellophane is treated with glycerine as a saturant to maintain the cellulose jacket soft and pliable (26).

The modern transparent packaging materials, such as caps, rings, bands and pellicles are usually made of regenerated cellulose and other cellulose compounds, gelatine, casein and the like. Glycerine is a prominent ingredient of these pellicles, added during manufacture, to keep the films flexible. These products are much used for sealing bottles and other containers. If a soluble nitrite is dissolved in the dilute glycerine solution in which these pellicles are stored, rust staining, when in contact with iron surfaces, will be obviated. In the case of dyed pellicles, the nitrate added to the glycerine solution will also prevent bleeding of the dye (27).

A British patent describes resistant, supple, transparent sheets impermeable to liquids and gases, made from gelatine solutions. These sheets are glycerine treated prior to further treatment by cellulose ester solutions containing tanning agents (28). When it is desired to make designs or write on finished films, the surfaces are hardened by a coating containing:

Alcohol	50
Glycerine	5
Formalin	30
Water	300

before applying the hot stamps for producing the design or writing (29).

Glycerine is likewise a constituent of many types of sealing compositions. A reaction product of glycerine and boric acid is intimately mixed with latex to form a mixture for sealing cans (30). One large food packing corporation holds patents on glycerine-containing sealing compounds for jars, cans and the like. These are mixtures of silicates, turgescent materials of colloidal character such as starches, flour, or proteins and glycerine as a hygroscopic agent (31).

While on the subject of packagings, a carton for oil and similar substances should be interesting. The body portion of this container is formed by windings of two or more layers of cellulosic material, such as chip board. This is coated internally with a compound of sodium silicate, glycerine and gum arabic. After further treatment, the exterior may be coated with the same compound (32). Greaseproof papers, particularly suited for wrapping foods, employ the glycerine-phthalate resins (33). Another type of paper, that is both grease- and moisture-proof and also used for wrapping edibles, is treated with an aqueous dispersion of rubber latex. Glycerine is used here as a hygroscopic plasticizing agent (34). Rubber, using glycerine as a hygroscopic flexibilizing medium, is used as a bonding agent, for paper and thin metal sheets. These paper-metal sheets should have numerous uses, not only for attractive packages, but also for other specialty uses (35).

Glycerine has many varied uses in other specialty papers. A cigarette paper which prevents cigarettes from smouldering is made by treating a portion of the paper with a mixture of water-glass, glycerine, starch and talc (36). A paper, used for separating sheets of tacky materials such as rubber, is prepared by coating same with a solution of sodium silicate, 140 parts; glycerine, 15 parts; and a small proportion of a wax emulsion (37). Glycerine is also used in duplicator sheets. Unsized paper is passed through a glycerine impregnating solution, further processed, coated on both sides with lacquer and finally coated with a hectograph compound (38).

The importance of glycerine in all phases of printing is well known. Printing rolls are, as a rule, made with glycerine. The usual mixture consists of:

Glycerine	40
Gelatine	53
Water	7

The glycerine may be varied from 30 to 80 per cent., to produce a hard or soft roll (39). Of recent years, modified alkyd resins have found application in the manufacture of printing rolls. Wiping rollers for removing excess ink or color in printing forms are made by covering a central supporting core with a layer of resilient material, composed of whiting, wax, glycerine, gelatine and water. The coating is then treated with an alum solution (40). Many other patented examples of similar uses of glycerine-glue or glycerine-gelatine mixtures in printing are available.

Most inks, whether for printing, lithographing or writing, contain glycerine. Government tests have shown it is the best fluid for use in recording instrument inks (41). Indelible and fraud preventing inks also contain glycerine. One such ink contains Ponsole Jade green with glycerine as a constituent of the aqueous vehicle (42).

Its importance as a supplying agent in the manufacture and treatment of leather, similarly suggests new applications in the manufacture of artificial leathers. A typical example is an artificial chamois skin, with a host of specialty applications, which is produced by impregnating a woven fabric or fibrous base material with a non-aqueous rubber compound containing glycerine as the hygroscopic agent (43). A natural chamois particularly suited for cleaning lenses is made by treating the skin with chromium oxide and glycerine (44).

Cleaning cloths and pads impregnated with certain esters of lauryl alcohol, cyclohexanol, glycerine, and water are used to remove and prevent moisture or bloom on polished automobile and other surfaces (2). A general polish (3) consists of:

Mineral oil	2.5
Turpentine oil	2.5
Alcohol	1.0
Glycerine	0.1
Calcium carbonate	0.6
Shellac	0.3
Animal wax	1.0

New automobile specialties find many uses for glycerine. Polishing and cleaning compounds are always in demand. A British preparation (1) for cleaning, polishing and reviving cellulose-containing coatings is composed of:

Water	48.9 lbs.
H_2SO_4	2.6
Methylated spirits	7.8
Glycerine	9.4
Ethyl lactate	1.9
Neuberg chalk	17.4
Burnt Turkey umber	1.7
B. P. petroleum polishers' oil	1.9
White spirit	5.0
Butyl acetate	3.4

Inasmuch as glycerine is an important rubber compounding material, it is finding increasing use in automobile rubber specialties. An anti-puncture compound consists of a mixture of comparatively large mica flakes, 18; more finely divided mica, 36; granulated soft cork, 13.5; and a cellulose ester, 35.5 per cent., is mixed with 2.4 times this basic quantity of a water-glycerine solution. The liquid and the cellulose ester form a viscous coating for the mica flakes (4). A patent, (5) owned by a large rubber tire manufacturer, used for making gas tight coatings, is made from a resin of the alkyd type. A waterproofing composition for automobile hoods consists of water, mica, glue, talcum, cork, rubber, glycerine and formaldehyde (6).

Laminated glass, so important a factor in automobile safety, employs glycerine-phthalate resins. A typical example of a laminating material consists of a resin made with glycerine, phthalic anhydride and casein. The final product may also be used in various types of coatings and in molded articles (7).

Numerous specialty cleansers contain glycerine. Soap is likewise an important ingredient of many of them. Some of these detergents are simple, others more complex. The following cleansing compound is typical of many others (8).

Potassium soap	120
Marble sand	70
Glycerine	3
Turpentine oil	1
Petrolatum	1
Citronella oil	3

A detergent for removing cellulose lacquer and stains from the skin is made of about 13 per cent. of a lacquer solvent such as butyl acetate, ethyl acetate or the like, combined with soap, 15; carbon tetrachloride, 7; glycerine, 7; a filler, such as diatomaceous earth; an abradant such as sand, 19; and water, 25 per cent. (9). A solution (10) particularly suitable for removing ink, dye and similar stains consists of a 20 per cent. solution of:

Titanium trichloride	1
Glycerine	1
Ethyl alcohol	3

A cleansing agent for use in making soaps, dentifrices and the like consists of the reaction product of coconut oil, 216 parts; glycerine, 64 parts; and concentrated sulfuric acid, 526 parts; neutralized with sodium hydroxide (11). A silver cleaning paste is made of a mixture of glycerine and sodium bicarbonate (12).

The growing popularity of winter sports for all-year-round activity has brought forward a large number of ice-simulating preparations, many of which use glycerine. One which has received much attention consists of:

Carnauba wax	100
Naphthalene	70–90
Montan wax	20

After the compound has been spread, its surface is coated with glycerine, as a lubricant. A small amount of soap solution may also be used with the glycerine. The inventors of this substitute ice include other similar formulas in their patent (45).

Dentists find many uses for glycerine. Abrasive polishing pastes consist essentially of powdered pumice in glycerine. "Disclosing solutions" for bringing out tartar stains contain large amounts of this fluid. Impression materials are also made with glycerine. Several such patents are given in the recent literature. One such material, suitable for dental imprints and the like, is described as a highly concentrated homogeneous gelatinous binder made of an agar-agar-water-glycerine composition. To this is added a mixture of hard and soft virgin rock such as ground quartz, soapstone, zinc oxide or clay (46). A similar material for this purpose differs somewhat. It contains distributed resilient vulcanized rubber filaments together with other ingredients such as glycerine, agar-agar, water, a rubber isomer solution, potassium sulfate, menthol and oil of wintergreen (47). The patentee of the latter invention has other dental impression materials credited to him (48).

The hygroscopic properties of glycerine, among its other valuable characteristics, make the inclusion of this fluid in specialty coatings a particularly important one. Glycerine will be found useful wherever excess drying and shrinkage is undesirable and where flexibility and suppleness must be maintained. A bookbinding adhesive that spreads rapidly and which produces a smooth, firm, flexible coating is made of:

Glycolboriborate	8
Bone glue	6
Glycerine	4
Spermaceti	⅓
Water	12

This adhesive has many other uses, aside from its particular adaptability for bindings (49). A leather-like material for wall coverings and the like is obtained from thin pieces of wood, subjected to the action of a diluted alkali solution. This causes swelling and loosening of the natural wood structure, without destroying the beautiful characteristic wood grain. The sheets are

washed and then treated with an aqueous glycerine solution (50).

Glyptal resins are used as binders in the production of pressed cork boards which have excellent physical, mechanical and oil-resisting properties. Cork flour is mixed with 10 per cent. commercial grade glycerine (75-80 per cent. pure) and 20 per cent. glyptal resin which is dissolved in an alcohol-benzene (1:1) mixture. This is followed by compression and thermal treatment. The blocks formed are cut into sheets of the desired thickness to fit a host of needs (51).

Some of the newer glycerine-containing specialties have been considered. The purpose of this review of the patent (and other) literature of the last two and one-half years has not been to list all of the glycerine uses, but rather, by selected examples, to illustrate the versatility and wide range of applicability of this unusual fluid. There is no doubt that glycerine can find use, not only in similar preparations, but also in a large variety of newer specialties.

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Names of the Month—

A Current Supplement to the Chemical Who's Who

FRASER, Oliver B. J., supt. tech. service on mill prods., Internat'l Nickel Co., Inc.; b. Brockville, Ont., Can., 22 Dec. 1895; mar. Effie J. LeFebvre, Kingston, Ont., Can., 11 Sept. 1923; 1 son; educat., Queen's Univ., B.Sc., 1916. Deloro Smelting & Refining Co., Deloro, Ont.; Mond Nickel Co.; chem. at Helen & Magpie iron mines of Algoma Steel Corp.; inspecting explosives for Imperial Ministry of Munitions, 1916-17; Internat'l Nickel Co., Bayonne, N. J., 1917-18; Internat'l Nickel Co. of Can., 1918-21; research for Internat'l Nickel Co. at Mellon Institute, 1922-23; head, res. lab., Internat'l Nickel Co., Bayonne, N. J., 1923-33; industrial develop. work on nickel alloys in petrol. industry for Internat'l Nickel Co., 1933-34; supt. tech. service on mill prods., Internat'l Nickel Co., 1933 to date. Canadian Field Artillery, 1916, C.E.F. Wrote papers on corrosion subjects and catalytic applications of nickel, talks on industrial applications of nickel and nickel comps. Memb., A.I.M.M.E., A.C.S., Electrochemical Soc., A.S.M.E., Amer. Welding Soc., Amer. Electroplaters Soc., Electroplaters and Depositors Tech. Soc. (British), Knights of Columbus. Address: 27 Stoneleigh Park, Westfield, N. J.

GERMUTH, Frederick George, hd., div. res., Bur. of Standards, City of Baltimore; b. Baltimore, Md., Apr. 6, 1891; mar. Anna Elizabeth Brown, Baltimore, May 18, 1910, 3 sons, 4 daus.; educat., Blue Ridge Coll., B.S. 1914, Johns Hopkins, spec. stud., 1921-23, U. of Md., Univ. of Md., Sc.D., 1936. Crown Cork & Seal Co., asst. chem., 1918-19; Wilson Martin Co., chem., 1919-21; City of Baltimore, bur. of water supply, chem., 1921-25; City Baltimore, bur. standards hd., div. res., 1925 to date; Sheppard-Enoch Pratt Hospital, consulting chem., 1925 to date; McCormick & Co., res. chem.; consult. & res. chem. Author several chemical papers. Memb., A.C.S., Chem. Soc., (Lon.), Md. Acad. Sciences, Am. Internatl. Acad., A.A.A.S., Soc. Hygiene, Abstractor: Chem. abs. (A.C.S.), F.C.S., Chem. Soc. (Lon.), Am. Internatl. Acad. Hobbies: music, motoring. Address: Bur. of Standards, City Balto., Municipal Office Bldg., Balto., Md.

PALMISON, Frank F., exec. dir., Universal Marble Prods. Corp.; b. Italy, 20 Oct. 1897; mar. Kaye Sanforo, Larchmont, N. Y., 19 Sept. 1936; 1 dau.; educat. Pratt Inst.; Fordham Law School. Registered patent atty., 1920-24; lawyer, 1924 to date; Universal Marble Prods. Corp., 1926 to date. U. S. A. 1917-19, commissioned air pilot, Capt. U. S. Air Service Reserve. Clubs: Elks, Mt. Vernon, N. Y. Lodge, Westchester County Bar Assn., Mt. Vernon's Lawyers Club. Hobby: chemical research into dolomite and its ingredients. Address: 676 Gramatan ave., Mt. Vernon, N. Y.

RUSHTON, John Henry, prof., chem. engr., hd. Div. Chem. Engr., Univ. of Virginia; b. New London, Pa., 25 Nov. 1905; mar. Ellott May McLellon, Phila., Pa., 9 Dec. 1933; 1 son; educat., U. of Pa., B.S. in Ch. E. 1926, M.S. 1929, Ph.D. 1933. Royal Electrotype Co., chem. engr., 1926-27; Kieckheffer Container Corp., chem. engr., 1927-28; Drexel Inst. of Tech., instr. & asst. prof. of chem. engr., 1928-36; Dow Chem. Co., consulting engr., 1936-37; Univ. of Mich., asst. prof. of chem. engr., 1936-37; Univ. of Va., prof. of chem. engr., 1937 to date. Rate of solution of magnesium in acids, *J. Phys. Chem.* 1934, liquid-liquid extraction, *Ind. Eng. Chem.* 1937. Memb. A.I.Ch.E., A.C.S., Soc. for Promotion of Engr. Education. Clubs: Free Mason, Farmington Country Club. Hobby: athletics. Address: P. O. Box 1775, University, Va.

Acid Costs—

Handling and Storage

By C. H. S. Tupholme

IN any chemical process, the cost of a consumable tool, such as hydrochloric and sulfuric acids in many essential processes, is sufficient to justify exhaustive investigations into its handling and storage. Since the price of the so-called "mineral acids" accounts for only 40 to 50 per cent. of the ultimate cost of employing it, the balance is necessarily an indication of the cost of conveying, storing and distributing it about the plant.

Conveying and distribution are factors under the control of the user. Under the heading of conveyance, the cost of filling, crating, bunging, weighing and loading some 20 carboys for every ton may easily add 33 to 66 per cent. to the actual cost of merely transporting the load from its source to its destination. This is absorbed in the price of the acid, and acid manufacturers provide means of eliminating this cost.

Acids are now transported by road, rail and water in bulk tanks, eliminating carboys and effecting an economy acid manufacturers are endeavoring to share with their consumers, many offering a substantial reduction to customers equipped with storage tanks in which to receive it. Since this is rarely less than $1 a ton and has reached $2 and even $3 a ton, such an appreciable reduction is inducement to bring about universal adoption of these improved means of conveyance.

Acid manufacturers providing the means of supplying consumers with cheaper acid may reasonably expect them to equip themselves with the means of receiving it in storage tanks. What was once a real difficulty no longer exists. A durable, practical storage tank with all the necessary accessories for distributing the acid to its final destination can now be installed.

A steel 10-ton storage tank efficiently protected by acid-rubber, with essential distributing accessories on a generous scale, can be installed for $400, and will last for 10 to 20 years if its outside is reasonably protected. Such a tank is appropriate to a weekly consumption of about 5 tons, or 250 tons a year. Since an investment of $400 in storage tanks and accessories brings in an annual dividend of at least $250 to a consumer of 250 tons a year out of the reduced price offered by the acid manufacturer alone, it cannot be regarded as a poor investment if it stopped there, but it does not. He also recovers the valuable floor space hitherto taken up by hundreds of carboys, the labor of unloading and reloading empties, handling them, and the annual bill for breakage, to say nothing of the acid lost. Any method of accountancy would charge the cost of employing acid with at least another 20 per cent. of the initial price.

Another costly item of employing acid is the maintenance of the plant subjected to its action. From 25 to 50 per cent. expresses the actual depreciation of the iron and wood vessels, tanks, troughs, filters, centrifuges, pipes, launders, etc., employed in the industries using these acids.

Rubber compositions of various kinds have been known and used long enough successfully to indicate rubber as the substance promising the solution of the problem. The early development was a composition to which sufficient rigidity or hardness was imparted to permit of the construction of the vessel itself. Such was hard rubber, which has many useful applications. It lacks, however, adaptability in application to many parts of plant requiring protection since it cannot be applied without removing the vessel, and cannot be vulcanized save in a vulcanizer, the size of which limits the magnitude of the vessel to which it is applied. Moreover, it loses rigidity and is deformed at comparatively low temperatures, and its brittleness renders it prone to fracture under variable temperatures.

Unappreciated qualities of soft elastic rubber compositions become recognized with the development of motor tires withstanding, as many do, the mechanical stresses and abrasive action incidental to a life of 10,000 miles and more. No less important is the new role found for a new elastic rubber composition called "acid-rubber," now largely used in the protection of iron, steel, wood, concrete, indeed, any material of which containers of magnitude may be constructed, from the action of acid.

This is a definite composition having chemical and physical characteristics of great inertness to the action of acid; astonishing tensile strength, little less indeed than that of the containers it protects, while its elasticity is so great as to entirely preclude fracture of the protective lining under any expansion or vibration. Unlike the "rubber" of commerce, it can be applied to existing irregular surfaces in its plastic condition and vulcanized where it stands without the intermediary of a "vulcanizer," thus lending itself admirably to application to existing plant without removal.

Another feature of acid-rubber is its adaptability to circumstances. It may be made inert to a large range of acid and alkaline liquids, and to a great range of temperatures without deformation by appropriately adjusting its components. Its elasticity is under control from a maximum of expansibility where it will return to its original length, after being stretched ten times its length, to the hardness and brittleness of glass. At this end of its adaptability it becomes the ebonite, vulcanite, or hard rubber alluded to.

In its soft elastic condition, such is its imperviousness that a relatively thin coating is absolutely liquid-tight; it is, therefore, relatively inexpensive and very easy to apply. Some early failures in effecting adhesion have now been overcome, and acid-rubber is chemically welded to steel, etc., so permanently as to defy removal.

Superiority and Economy of this Equipment

These rubber linings have materially changed the relative importance of the two elements of such composite vessels. The function of the steel or wood element is merely to sustain the shape of the lining, the function of which is to contain the liquid and withstand the chemical action. Such a composite vessel, therefore, may be lighter and less expensively constructed, largely discounting the cost of the rubber lining. Moreover, the rubber withstands the chemical action from 10 to 100 times longer than steel or wood, and may be cheaply repaired or renewed.

While there is no wood or metal which does not re-act chemically with acid and most alkaline liquids more or less rapidly, discoloring and contaminating the liquid, there are rubber linings so inert to the action of even very strong acids as to disclose no reaction under rigid chemical analysis after prolonged contact.

Since there is no universal medicine, there is also no rubber composition universally applicable to every acid and every alkaline liquid, hence the protection of industrial plant by rubber has become the specialized business of chemical engineers qualified in their training and experience to adjust the components to the liquid and process concerned.

Industry's Bookshelf

Copies of these, or any other books published, will be supplied postpaid on receipt of price, or shipped C.O.D. plus postage where remittance does not accompany order.

Book Department **Box 1405**
CHEMICAL INDUSTRIES **New Haven, Conn.**

Silicate Analysis by A. W. Groves, Thomas Murby & Co., London, 230 pp., 12s. 6d. A guidebook for the chemist in petrology and for the geologist in the principles and technique of analytical methods. Geologically these silicates are the most widely dispersed minerals and they are of growing industrial importance.

Introduction to Ferromagnetism by Francis Bitter, McGraw-Hill, N. Y., 314 pp., $4. Puts special emphasis upon the aspects of ferromagnetism which promise to be of interest in the near future, such as the light that this phenomenon throws on the properties and structures of metals.

The Cavalcade of America by Dixon Ryan Fox & Arthur M. Schlesinger; Milton Bradley Co., Springfield, Mass., 300 pp., $2. Adapted abstracts from du Pont's well known broadcast—a series of brief sketches in American history: vivid, interesting, and with a chemical turn.

Advertisement Layout in Practice by Leonard Sharpe, Macmillan, N. Y., 44 pp., $1.25. Sets forth by means of actual working sheets and charts the theory and practice of attractive advertisement design.

The Labour Contract by B. F. Shields, Burns, Oates & Washbourne, London, 152 pp., 5s. From local guild to nationwide union, traces conditions of work and wages from the Roman Catholic point of view.

An Index to Business Indices by D. H. Davenport and Frances V. Scott, Business Publication, Inc., Chgo., 187 pp., $3. Fulfils the promise of its title admirably.

Vitamins by Bernard L. Oser, Blakiston, Phila., 90 pp. Extremely valuable, concise summary by a real authority.

N. R. A. Economic Planning by C. F. Roos, Principia Press, Bloomington, Ind., 595 pp., $5. Painstaking, well documented study of the evolution of N. R. A. policies in their broader economic aspects.

How to Deal With Organized Labor by A. Feller and J. E. Hurwitz, Alexander Pub. Co., N. Y. C., 678 pp., $6.50. A friendly and competent guide through the mazes of recent labor laws.

National Debt and Government Credit by P. S. Stewart & R. S. Tucker, Twentieth-Century Fund, N. Y. C., 171 pp., $1.75. Closely focused study on the effect of the government's debt on national credit.

Qualitative Analysis by Spot Tests by Fritz Feigl, Nordemann Pub. Co., N. Y. C., 400 pp., $5. The first nearly adequate treatment of qualitative analysis by spot testing translated from the German by Janet Matthews.

Manual Table of Constants, index to Volume 6 to 10, 1923-30, Furman & Cie, Paris.

Synthetic Rubber by W. J. S. Naunton; Macmillan, N. Y., 162 pp., $2.50. Particularly interesting for its history of research and development in Great Britain, but also, a good brief review of the technique of manufacture and of obligations.

Modern Life Chemistry by Frank O. Kruh, Robert H. Carleton and Floyd F. Carpenter; Lippincott, Phila., 734 pp., $1.80. A high school text worked out on the basis of unit problems, each exemplifying five basic chemical principles.

Lubricating Greases by E. N. Klemgard; Reinhold, N. Y., 873 pp., $15. Masterly work covering in accurate detail, the technology, formulation and use of greases of all types.

Outline of Patent Law and Digest by Emerson Stringham, Pacot Pubs., Madison, Wis., 691 pp., $9. Outstandingly useful book, splendidly indexed, with a fine bibliography; invaluable as a practical working guidebook.

Handbook of Chemistry by Norbert Lange, Handbook Publishers, Sandusky, Ohio, 1802 pp., $6. In the three years since its first publication "Lange" has won the enviable reputation of answering more questions more quickly and completely than any similar handy reference book. The new edition has been completely revised, and good material added that increases the number of pages by nearly 300. An extremely valuable feature is its incomparably complete index, more than 2700 entries.

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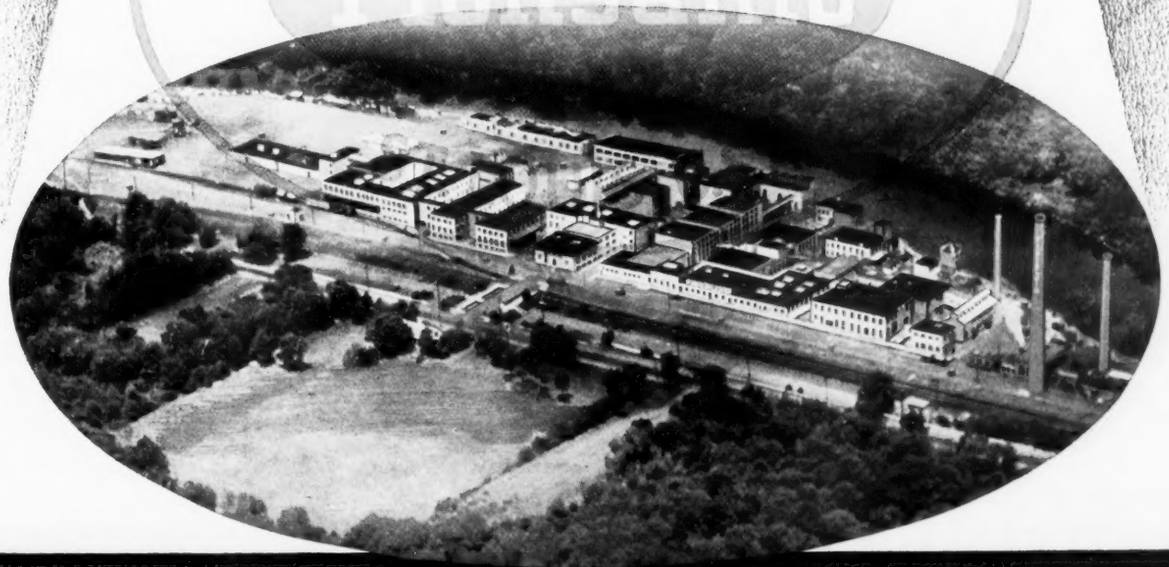

FIBESTOS • FIBERLOID • FIBERLON • FIBERLAC

Le Blanc Forced by the French Tribunal to Make His Patent Public.

Through The Centuries With Alkalies

Nicholas Le Blanc is known as the father of modern soda manufacture. His invention was mothered by necessity, for he won a reward of 2400 livres offered by the French Academy of Science in 1775 when the Seven Years' War with England and the Napoleonic Wars throughout Europe shut off France's supply of Spanish barilla from which most soda was made at that time. The French Revolutionists robbed Le Blanc of the fruits of his invention and he died in 1806 a suicide in an almshouse. His process, however, was so nearly perfect that it endured with little change for over 50 years.

Splendid as Le Blanc's achievement was, the soda produced to meet today's exacting standards is of a quality undreamed of in that earlier era. COLUMBIA'S well-known reputation for setting these standards still higher, backed by its air-tight system of control, insures its customers a product second to none in quality . . . which includes purity, uniformity and whiteness.

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SODIUM BICARBONATE
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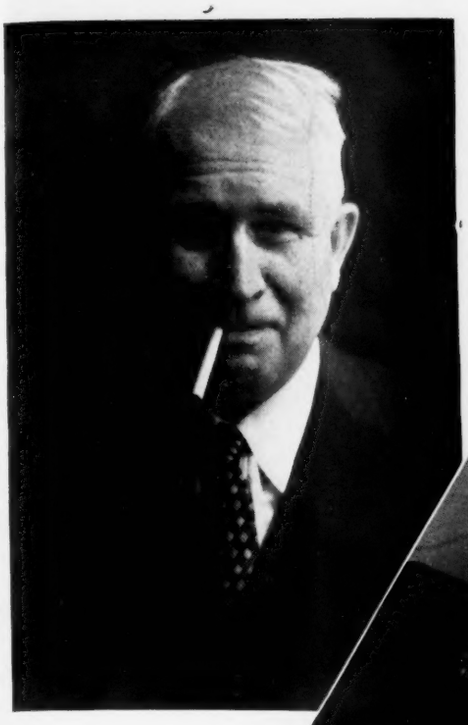
"Headliners"



Versatile Dr. Walter S. Landis, photographer of the pictures on page 430, recently elected president of the Chemist Advisory Council, who is at present on another chemical junket to the West Coast.

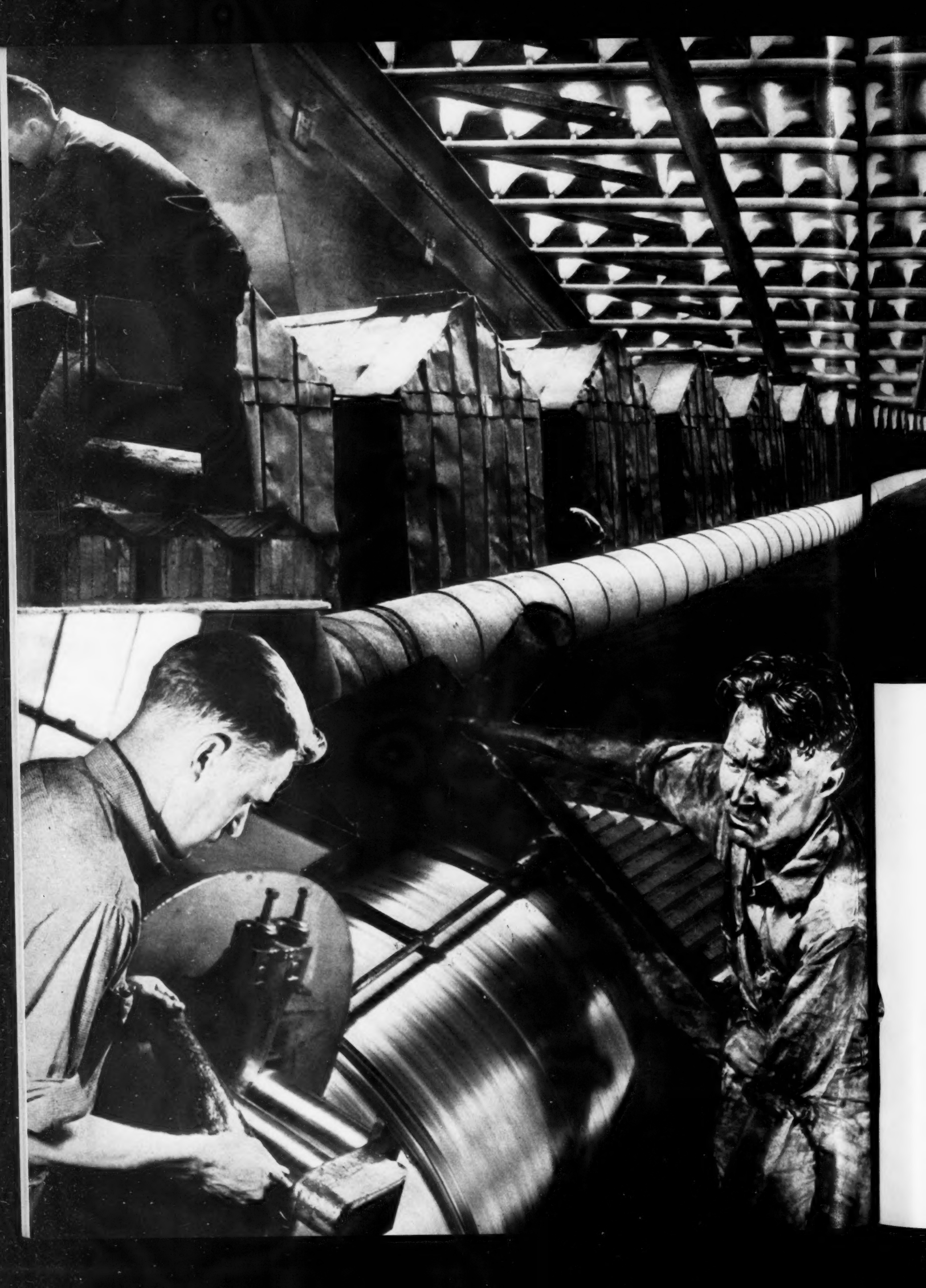
R. L. Hock, superintendent, International Division, U. S. Industrial Alcohol plant at New Orleans, La.—a unique photograph which candid cameraman E. L. Luaces (Acticarbone) claims is the only one in existence of this well known operating executive.

Another Cyanamid traveler, Warner D. Huntington, director in charge fertilizers, who is on a trip through the Far East.

"The Two Marcellas"—the boat and the missus. Photograph of "The Marcella," which, until it burned recently, was owned by Dr. Elvin H. Killheffer (du Pont), who was on board, but escaped without injury. The boat was named for Mrs. Killheffer, who is shown on the pier. The "skipper" is shown with one of his catches.

Fred Lancaster's death from appendicitis in Hawaii, last month, was an untimely close to the life of one of the country's best known alkali executives.

The winter meeting, Piedmont Section, American Ass'n Textile Chemists & Colorists, held recently in Greenville, S. C., attracted a record attendance. Some of the section leaders and featured speakers are shown above, left to right: Dr. Raphael E. Rupp, president; Dr. Claudius T. Murchison, president, Cotton Textile Institute, who delivered address; Dr. Sievert Glarum (Rohm & Haas), a featured speaker and former research associate of the Ass'n; Arthur Thompson, national vice president, and Samuel L. Hayes, southern manager, Ciba, former chairman of section.

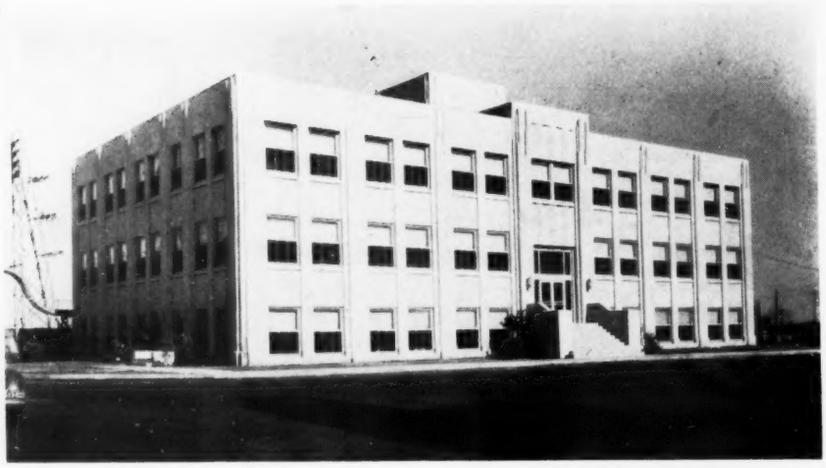


Carbon Black to Specifications

This striking pictorial pot-pourri, "blown up" to gigantic size, that visualizes graphically the world's largest carbon black plant, covers one wall of the new reception room at the New York offices of Wishnick-Tumpeer. Though enormous, this new Continental Carbon plant is constructed on the multiple-unit basis, so that various grades of black may be produced on a large scale, under scrupulous control, with complete uniformity to meet exacting specifications. Photographer, Robert Yarnall Richie, has caught both the magnitude and exactitude that characterize this chemical operation in one of his most happy chemical "shots." But size, though the most obvious feature of this plant, is not really its most distinctive feature. Its physical equipment is "the last word" in carbon black production. It takes advantage of every device to assure uniformity of product. It handles, packages, and ships its carbon by the most modern methods—indeed "up-to-the-minute" is the best description.

The Continental Carbon plant has 366 production buildings covering 160 acres. From the meter chart that controls the inflow of gas to the burners (vital factor in the quality of the carbon black) to the scales on the bag-filling machines, control—automatic and chemical—is scrupulously practiced. There are 1,185,840 jets in the burner houses. The great agitators, which remove air from the carbon black; the precision packaging machinery to assure uniform weight of every bag; the periodic laboratory tests, to meet consumer's requirements, are all notable features of this modern installation.

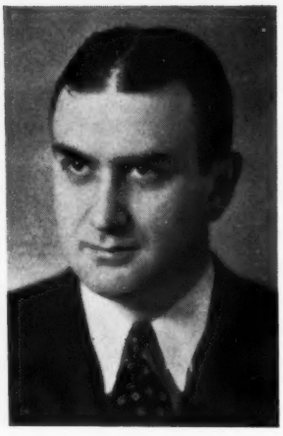
Carbohydrate Research by Staley



New laboratory of the A. E. Staley Mfg. Co., Decatur, Ill., where the company's research activities in its widely diversified line of products will be carried forward to a greater degree. Company originally started with starch and feed and oil.

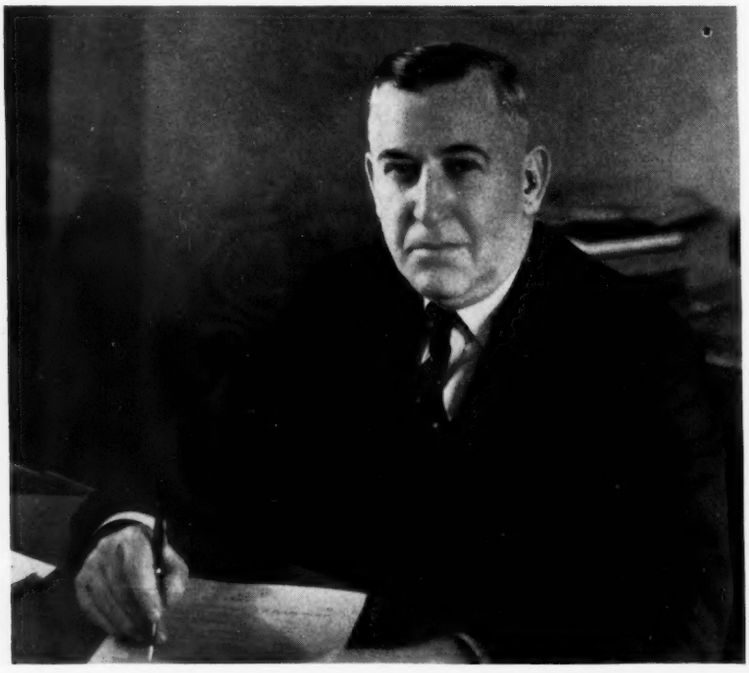
L. R. Brown, director of the process control laboratory, has been with the company many years, coming there from the laboratories of an oil company.

L. O. Gill, director, sales service laboratories, has practically grown up with the company, working here before, during and since his university days. His only time out has been for army service, and a year's additional college work.



W. W. Moyer, who assumed his duties as director of research a year ago, has had several years' graduate work in this country and abroad, and practical experience in commercial laboratories.

W. B. Bishop, director, chemical engineering, largely responsible for the completeness with which the laboratory is equipped, joined the company eleven years ago. He came direct from Columbia where he had been doing graduate work.



Howard File, in charge technical department, came to the laboratory so early in the company history that he even had to make some of the apparatus he used. For five years he was gone from the company, but returned to take charge of the greatly enlarged department in 1919.

ADVERTISING PAGES REMOVED

Plant Operation and Management

A digest of new methods and plant equipment

Container Users Exchange Ideas

Packaging Exposition at Chicago Brings to the Surface New Techniques and New Ideas for the Bulk and Packaged Chemical Maker

AFTER breaking the disturbing news that the country is in a recession, Irwin D. Wolf told the annual luncheon meeting of the American Management Association at the Palmer House, Chicago, March 23, that the greatest advances in packaging were made in the depression years of 1932-33. He then warned his audience of 250 manufacturers that competitors will surely utilize the present lull to improve still further containers and methods of packaging and that if they neglect to join the procession they will bring up the rear in the next forward business movement.

"Manufacturers must watch closely the new trends in packaging," said Mr. Wolf, who is vice-president of Kaufmann's Department Store in Pittsburgh and the donor of the Wolf Packaging Awards, "to be continuously on the alert to detect quickly the favorable and unfavorable reactions to their packages, and finally must have courage to make whatever corrections are necessary without undue delay."

Some 8,000 men and women registered in the 4-day Packaging Exposition to view the 75 instructive exhibits of packages, packaging machinery, and packaging accessories of various kinds. Over 1,000 attended the packaging clinics at which 54 experts delivered papers; hundreds of experts voiced opinions and related personal experiences in the informal discussions.

Right, standing, T. M. Scruggs (Bemis Bro. Bag Co.) who discussed "Bags: Printing and Design"; and right, R. H. Procter, Manager Sales Promotion Dept., St. Regis Paper, who presided at the second day of the bulk packaging conference. Below, extreme left, R. W. Lahey, Production Division, American Cyanamid, who presided at the first day's session. To his right, A. G. Clark (Bagpak, Inc.), who discussed proper carloading of bags.

Below, facing Mr. Clark is Irwin D. Wolf, vice president, Kaufmann's, Pittsburgh, and donor of the Wolf Packaging Awards, who was the principal speaker at the annual luncheon of the American Management Association, held in conjunction with the Packaging Exposition. Extreme right, T. P. Callahan (Monsanto) who was introduced by R. W. Lahey as the "Father of bulk packaging in the chemical industry."

The Packaging Conference and Exposition has become "inventory taking" time of container progress, the annual check-up by manufacturers, engineers, designers, and advertising men. The major divisions of the program were: Packaging Machinery; Packing and Shipping; Unit Packaging and Bulk Packaging.

Bulk Packaging Sessions

The bulk packaging group proved to be a lusty two-year old prodigy. The first day's activities were under the guidance of R. W. Lahey, production division of American Cyanamid Co., who pointed out that "Our big job is to get bulk packaging out of our heads and on to paper." Mr. Lahey said that if more technical data were readily available then the lot of the production managers in the chemical field would be happier. He reminded his audience that new products now coming from research laboratories are requiring a new technique of packaging, handling, and dispensing.

The chairman in calling attention to the fact that the program of the bulk packaging group was made up, with but one or two exceptions, of container manufacturers, pointed out that many of the improvements in bulk containers have come from shippers, not from the container manufacturers, and that the opposite condition would be more healthy and satisfactory, and that more companies in chemical fields, where bulk packaging is employed extensively, are becoming package conscious and anxious to improve appearance and serviceability of containers even at increased cost.

Slack and Tight Barrels

Lawrence Fraizer (Illinois Cooperage Mfg. Co.) called attention to the improvements in slack barrels, the principal ones, perhaps, being the kiln dried staves and tongued and grooved staves. Discussion dealt largely with cooperage problems, and speaker urged greater cooperation between the barrel user and the barrel manufacturer and greater use of the technical facilities of the Associated Cooperage Industries. The tight barrel was discussed by George Dyer (Pioneer Cooperage Co.). A knowledge of construction and strength limits is required to choose the most economical type to supply proper protection, and he discussed briefly the advantages of the tight barrel for different liquids.

Loading and Staying of Carload Shipments

The "Father of Bulk Packaging in the Chemical Industry," T. P. Callahan, Monsanto Chemical, Merrimac Division, said in part: "A car and its load must meet and survive three classes of shocks. These are as follows: 1. Train vibration; 2. The impact of starting and stopping; and 3, The heavy shocks of switching. We do know from observation that the destructive effects of car collisions increase very rapidly with speed and that the rules for coupling cars have been framed to keep speed down to the lowest practical limit. We also know that the train crews exceed more frequently than they observe the prescribed limit of two miles per hour; that if they did strictly observe this limit, their work would be delayed in classification yards; that the automatic couplers and both the gravity and retarding humps are modern necessities and furnish an apparently unavoidable combination, tending in a busy yard to cause violations of the coupling speed rule.

"The increased speed of freight trains necessitates greater precaution in protecting the lading. Carload bracing must be secure and must possess a certain amount of "give" or elasticity to absorb the vibration and shock of various stops in switching, which are an unavoidable hazard. Protection in shipping and delivery to destination are more essential than the actual cost of carload binding, lumber, dunnage, plank bracing or any other form of stowage. If a shipper can ship to destination with a maximum guarantee of safety, quite naturally it follows that shipping costs will be decreased, freight claims lessened, and customers more satisfied. Lumber and bracing have their place in carloading, but improved loading methods have been devised which can definitely save time and prevent damage to contents."

In leading a most illuminating discussion on loading and staying Mr. Callahan called upon the following: W. S. Redhed, president of the Impact Register Co.; Edward Dahill, chief engineer of the Freight Container Bureau of the Association of American Railroads, and engineers from The Gerrard Co., Chicago, stowage engineers.

A Packaging Institute?

Before opening the afternoon session, Mr. Lahey reported a movement to form a Packaging Institute under the guidance of The American Management Association and asked for written expressions of opinion. W. B. Thomas, Steel Barrel Manufacturers Council, then presented three ten-minute papers on the following subjects: "Interior Coatings for Steel Drums and Other Steel Packages." "Advantages of Re-Rolling Expanded Hoops in 16, 18, and 20 Gauge Steel Drums." "Precautions Taken by Steel Drum Manufacturers in Checking Steel Sheets for Imperfections."

The Friday bulk packaging session, directed by R. H. Procter (St. Regis Paper), brought out many new interesting thoughts on bags and their proper use. First on the program was a paper on "Bags, Printing and Design," by T. M. Scruggs (Bemis Brothers Bag Co.) who claimed that far too many brand designs on bags are reminiscent of Civil War barrel head labels and then laid down the following procedure for getting a well executed design.

"First, simplicity. For pictorial work the flat poster design lends itself best to rough textures and the dark background of burlap and kraft paper. The more modern stylized technique of pictorial work is to be preferred to attempts at realism like a landscape or dinner scene. Remember bags are viewed at a distance, on the shelf or in a mass display. Second, type matter and copy should be tied in as a component part of the design so that the whole may have a pleasing, balanced effect and to focus attention upon the one thing that it is desired to stress. Third, a rational balance of colors to avoid discords. For instance, two discordant hues of strong value and chroma may be brought fairly well into harmony by toning down the hue of the larger area to a lower value or to a lower chroma or both. Much can be accomplished merely by observing the few simple rules of color balance.

"I should like," the speaker continued, "to mention that the purchaser of bags gets a mighty lot of printing for the 2, 3, or 4 dollars per thousand printing cost. Please do not forget that burlap, cotton, spun paper and even smooth surface papers soak up tremendous quantities of costly inks and that the wear and tear on plates pressing this ink down into and between the threads is no small item of expense. The cost of the printing on a bag is only a very small fraction of one per cent. of the sales value of a sack of merchandise. Inasmuch as some printing is a necessity for identification purposes and to comply with various regulations the extra cost of a good design over the cost of a mediocre design is negligible. Bag manufacturers are anxious and able to cooperate constructively in the development of good designs."

Progress in moisture and water protection in the bag field was discussed in considerable detail by C. H. Hartman (St. Regis Paper). Several types of moisture proofing materials were compared and later discussed in the open forum.

Filling and Closing Machines

"A fundamental requirement for all successful filling is uniformity of flow from the storage bin to the filling machine," H. H. Leonard (Consolidated Packaging Machinery Corp.) told a large audience at the final bulk packaging session. "A free flowing material almost automatically takes care of this by the action of gravity, but as we pass through the various gradations towards the non-free flowing groups we find that we can-

MOISTURE REMOVAL

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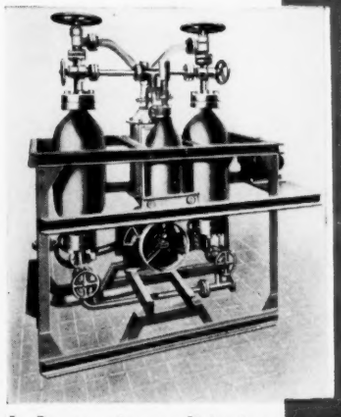
Removal of moisture from gases and vapors by *adsorption* offers a degree of flexibility, economy and safety far greater than that of methods employing corrosive, dangerous chemicals.

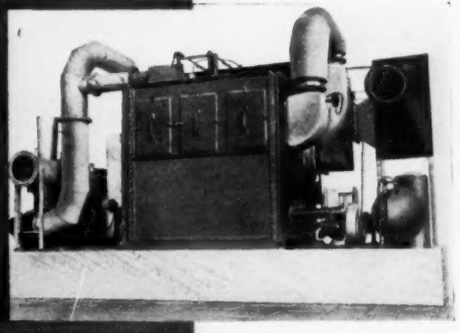
The ACTISEC Process* of dehydration by *adsorption* represents the ultimate in simplicity and efficiency—and its initial and operating costs are extremely low.



I—Large air conditioning unit. Full automatic operation. Air flow hand regulated if desired.

WIDE ADAPTABILITY—The use of this Process extends wherever moisture control is necessary—from air conditioning in the home to the production of war gases.

The manufacture of textiles, foods, chemicals and pharmaceuticals, rubber, cardboard, paper, glue, telephone cables and a multitude of other products—requires humidity control for maximum efficiency. In all these industries the ACTISEC Process* is in use. Its field of application is almost without limit. With it air, oxygen, hydrogen, nitrogen, carbon monoxide and dioxide, sulfur dioxide and trioxide, etc., may be had with a moisture content down to a dew point between –30 and –60° C. as required.



II—High-pressure gas dehydration unit. Manual operation. These are designed for any required pressure.

EQUIPMENT is designed to meet individual requirements. It may be constructed from practically any metal, including stainless steels, clad steels, Everdur, Monel, nickel, copper, aluminum, etc., depending on operating conditions.

OPERATION is controlled on a predetermined cycle, fully automatically, by means of a patented mechanism. It is foolproof—and requires no labor—no attention.

FREE CONSULTATION—Our engineers, experts in industrial adsorption for more than fifteen years, are at your disposal for free consultation. We are prepared to survey your plant, and to design and construct process equipment to be installed by us, or with our supervision, under absolute guarantees of cost and efficiency.

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not depend upon gravity to provide the force that will move the material. A number of devices are available for this purpose. Equipment intended for packaging a free flowing material cannot handle successfully a non-free flowing material. This point cannot be too strongly emphasized.

"There are four generally accepted methods of filling dry materials and all types of filling equipment can be placed on one of these divisions direct or slightly modified: 1—Net Weighing; 2—Gross Weighing; 3—Volume Filling; 4—Combination of Volume and Weighing.

"Each method has characteristics which render it especially suitable for certain conditions. They should not be considered as competitive. 1—Shipping and marketing requirements to be met. 2—Property which the material may possess as affecting the possibility of compacting it in the bag after filling. 3—Some mixtures are so composed that they require a balance to be maintained by different grades or ingredients making up the mixture. This condition imposes a requirement which must be very carefully considered when selecting the packaging equipment. 4—One of the types of material included in the dry group is that which has a relatively high viscosity—or in other words—plain sticky. Materials of this type are nearly always very troublesome to handle which, together with the small volume, are probably the chief causes for failure to develop much machinery in this field.

"May I also call your attention to the importance of bin construction—the bin which is the immediate source of supply for the material to the filling machines. Too frequently we think of these bins as being a repository for a surplus quantity of inert material. As a matter of fact, a well designed bin should be considered as merely an enlarged connection between the manufacturing process and the packaging process. Its purpose is primarily to take up the slack in requirements between these two departments. If the material is thought of as being in constant motion a better understanding will be had of the requirements of the bin. Improperly designed bins probably cause more trouble in the operation of filling machines than any one single thing. Projections into the bin which interfere with the flow, or shapes of bins which permit bridging and arching of material are constant sources of trouble.

"Semi automatic and automatic machinery is available for all types of closures. Machinery is now available for filling and closing open mouth heavy multiwall paper bags completely automatically except for the placing of the empty bags in position. It now is possible automatically to fill, close and convey bags into the freight car or to the storage room.

"Remarkable progress has been made in the design of filling and closing machinery for all sizes of bags. Conveyors are now provided that automatically take the filled bags from the filling machine and deposit them in the railroad car being loaded."

The finale of the bulk packaging conference was the showing of three motion pictures illustrating the filling, closing, handling, and shipping of open-mouth paper bags, textile bags, and multiwall paper valve bags.

Mr. Baum also laid down basic rules for the establishment and effective operation of a packaging committee. Basically he believes the personnel should be picked by these rules:

1. The committee shall be qualified to supply the designer with complete information pertaining to merchandising objectives, production technique and cost limitations. This would seem to require a minimum personnel consisting of the sales, production, and advertising managers. This group may be augmented by subordinates in closer touch with details.
2. Committee members shall hold full authority to make final decisions.
3. The officials of the company shall announce the existence and authority of this packaging committee to the entire organization.

So much for its establishment; I think rules such as these should make its operation effective:

1. The committee shall organize its requirements before selecting the designer.
2. The committee shall determine in advance the cost, approximately at least, of the package development, including designer's fee.
3. The committee shall select a qualified designer.
4. The committee shall provide a system of checks and controls to insure complete fulfilment in the finished package, of all requirements.
5. The committee shall meet at least once each year to make a survey of all the company's packaged merchandise and prepare a re-design schedule.

The Unit Packaging Group led off with a discussion on "Informative Labeling," by Donald M. Nelson (Sears, Roebuck & Co.) and Mrs. Carol Willis Moffet. The latter, emphasizing that the consumer needs all the facts which indicate the real worth of the product printed on the label, discussed the formation of the Consumer-Retailer Relations Council six months ago and reported that this organization offered a medium through which organized consumers and retailers could cooperate in solving some of their common problems. To make specifications more readily understood the Council is suggesting that the facts about a product be grouped under the following headings; recommended use; what it will do (performance); how to care for or use it; what it is made of (kinds and quality of materials); how it is made (construction); and finally, who sponsors it.

A highlight of the convention was the address "A Working Plan for Package Development," by Roland L. Baum (United Drug Co.) who assumed that the research laboratories have developed a new product, the formula has been approved, production, sales and cost factors have been settled and it is ready to acquire packaged form.

Other outstanding papers in the unit packaging group included "Merchandising a New Package," by F. D. Gonda (Einson-Freeman Co.); "The Essentials of a Satisfactory Package," by Ben Nash; "Protective Packaging Materials," by Charles E. Fawkes (Pyroxylin Products, Inc.); "Packaging Research," by Everett Worthington (American Can Co.). Mr. Gonda stressed the vital necessity of dramatizing in every possible way the new package. Mr. Nash pointed out that a sound and skilful packaging development should be done under the dual direction of the sales, production or purchasing executive and a package design consultant. One to direct the sales, cost and production requirements while the other enlists and directs the creative ingenuity and visual aspects to conform to the basic merchandising essence. Mr. Fawkes discussed the intrinsic moisture-proofness of many protective materials currently used in packaging, and stressed, particularly, the new trend of lacquered tight-wrapped labels for cartons, canisters, and the like. Mr. Worthington discussed in detail such matters as size, shape, and material to be employed.

Lead Arsenate Process

Manufacture of lead arsenate (and lime arsenate, as a by-product) by a method which offers the advantage of direct production of the arsenate in a form suitable for use as an insecticide, is the subject of E. P. 477,431 (*Chemical Trade Journal*, Feb. 25, '38, p. 149). A suspension of lead sulfate is caused to react with sodium arsenate which is present in excess, the reaction taking place with heat and agitation until a precipitate fundamentally composed of triplumbic arsenate is formed, which is treated with an acid so as to transform the triplumbic arsenate almost completely into acid lead arsenate. Preferably the acid employed is sulfuric. The lead sulfate used may be that which is formed in the chambers used in the lead chamber process for the manufacture of sulfuric acid, while the sodium arsenate may be that formed as a by-product in the refining of lead.

New Equipment

Sealed Ball Bearing for Mixers

The problem encountered by Mixing Equipment Co., Rochester, N. Y., of preventing oil or grease leakage around the vertical shaft of their Lightnin portable type mixers, has now been solved by use of a sealed ball bearing. Long breakdown tests show that the life of the bearing will usually be longer than the ordinary ball bearing because proper lubrication is assured and because no dirt or grit can enter the bearing.

The only modification necessary was to supply a small amount of dry absorbent material in place of the impregnated flax packing formerly used. This was to absorb and retain the small amount of low melting point grease that was applied to the outside of the bearing to prevent rust and which could not be completely removed in assembly.

Cam Operated Circuit Breaker Mechanism

A circuit breaker mechanism has been developed by the switchgear division of General Electric to supersede the centrifugal motor mechanism formerly used to operate Type FH oil-blast circuit breakers. Supplied for d-c operation, the new Type ME-10 mechanism is a positive, high-speed, efficient, motor-driven cam device which operates smoothly, requires no close adjustments, and takes four inches less headroom than the old type.

New Source of Ultra-Violet

A highly flexible source of ultra-violet radiation, consisting of a quartz-tube mercury vapor arc of improved efficiency mounted within a special reflector on a portable laboratory stand, is announced by General Electric Vapor Lamp Co., Hoboken, N. J. The sealed mercury vapor tube has high radiation characteristics in both the near and far ultra-violet zones, without the high heat losses and operating and maintenance problems inherent in open arcs. Rated operating life of the new tube is 2,000 hours. New unit should prove particularly suitable in bacteriological and chemical research involving the effects of radiant energy at the various ultra-violet frequencies as well as for industrial weathering tests and other types of industrial radiation work. With available filters, it is also highly efficient for research in the field of fluorescence, for criminal investigation, restoration of old paintings, mineralogy and the like.

Anodic Treatment of Aluminum

Hanson-Van Winkle-Munning Co., Matawan, N. J., recently completed the first two units on an order for eight motor generator sets to be used in the anodic treatment of aluminum parts. These sets are unusual in that they are larger than sets ordinarily used in the past and are equipped with automatic control devices, designed to vary generator voltage through a predetermined cycle of values as required for the specified treatment of a batch of aluminum parts.

The normal rating of the generators is 1500 amperes at 50 volts on the basis of continuous operation.

Globe and Angle Valves

Iron body globe and angle valves designed to withstand exceptionally severe service are being offered by Crane Co., Chicago. Valves are recommended for 150 lbs. steam working pressure and 300 lbs. on cold water, oil or gas lines. They are made in sizes ¼ to 3-inch, and also are recommended for throttling service.

Vibrating Screen

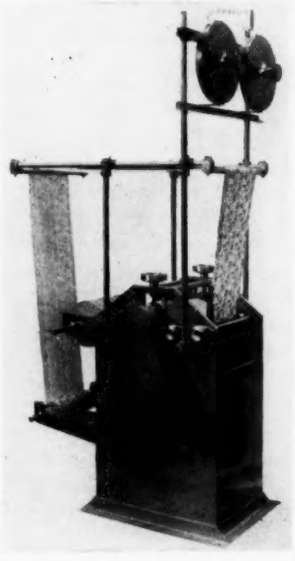
Production of a vibrating screen, suitable for screening in industries where cleanliness and accuracy of separation are essential for product and process control, is announced by Ajax Flexible Coupling Co., Westfield, N. Y. This flat screen is built low to occupy minimum height and can be arranged for either floor, ceiling or wall mounting. Screening compartment and drive unit are completely enclosed in dust- and oil-tight housings.

Proportioning Equipment

For accurate proportioning of lime and similar suspended chemicals, D. W. Haering & Co., Inc., 3408 Monroe St., Chicago, Ill., announces development of a new proportioning unit, Model "S" Feeder, employing the Haering fluid piston principle. Feeder is equipped with an agitator installed in the reagent compartment which is so designed and installed as to permit continuous agitation of the reagent without danger of emulsifying the oil.

Resin Handling Method

For many years the paper industry has realized the advantages of making paper available for a larger number of uses by means of coating the surface with a non-fibrous film, and many resins have come into the market recently which lend themselves to a non-hazardous, high speed, desirable coating method. A new method, announced by Bert C. Miller, Inc., Woolworth Bldg., New York City, concerns simply the application of resin to paper in a molten condition. Resin material when molten is really an adhesive as contrasted to wax as being a lubricant, therefore equipment must be employed which allows handling of a very sticky material. Also, the coating is solidified solely by chilling at room temperature, which means a very rapid setting of the film and therefore the smoothing of the surface must be accomplished by mechanical means rather than a normal "flow-out." The equipment for carrying out this method is of the simplest possible design, as shown in the photograph. Pigmentation adds a new chapter in this development, one where the paper becomes secondary to the film; in other words, the paper serves only as a carrier for the coating. The base paper may be unbleached or not entirely clean, or screenings stock, etc., as the pigmented coating, brings it up to the highest standard. This process fits into a unique position. A demand from the trade has been established by the lacquer coatings, but the filling of this demand by the paper board manufacturer has largely been curtailed because of difficulties of operation inherent to the lacquer process.



Brass Valves for 350 lbs. Steam

A line of brass screwed end globe and check valves for 350 lbs. steam pressure at 550° temperature is being made by Crane Co., Chicago. These valves are designed especially for high pressure steam lines such as are used on oil and gas field boilers for deep well drilling operations. They also may be used on non-shock cold water, oil or gas lines up to 1000 pounds. Their sizes range from ½-inch to 2-inches.

In order to have a companion line of brass gate valves for this same service, a 350 lb. steam rating at 550° F. has been added to the regular Crane No. 230-H brass gate valves.

Booklets & Catalogs

How to get these booklets: Companies will be glad to supply copies free, provided "Chemical Industries" is mentioned and the request is made on company stationery. Your business title should also be given.

Aerosol Wetting Agents. Booklet, lists various types available in this range of synthetic chemicals; summarizes advantages, uses, physical properties, and gives formulas for use; six useful graphs included. American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, N. Y. City.

Aluminum News Letter. February, 1938, most interesting issue on progress achieved in our modern transportation systems through use of aluminum. Aluminum Co. of America, Pittsburgh, Pa.

Automatic Dehydration of Crystals. Booklet fully describes and illustrates Super-D-Hydrator for ammonium sulfate and other crystals, its outstanding advantages and operation. Sharples Specialty Co., 23d and Westmoreland sts., Phila., Pa.

Bagology. February, 1938, published to keep users of cotton, burlap and paper bags up to date on latest developments in this field. Chase Bag Co., 155 E. 44th st., N. Y. City.

Bakelite Review. April, 1938, molders of plastic products will find this issue particularly interesting from point of view of the ever-widening uses to which plastics are being adapted. Bakelite Corp., 247 Park ave., N. Y. City.

Brown Hygrometers. Catalog No. 6502, complete line of company's recording and controlling hair hygrometers (both electrically-operated and air-operated humidity controllers) described, illustrations. Brown Instrument Co., Phila., Pa.

Circuline Sludge Collector. Book No. 1642, on mechanical unit for removal sludge in round settling tanks at sewage treatment and water purification plants. Link-Belt Co., 2045 W. Hunting Park ave., Phila., Pa.

Combination Magnetic Switch, for full-voltage starting of induction motors. Bulletin GEA-1587C, salient features discussed, series of photographs explain operating methods. General Electric Co., Schenectady, N. Y.

Conical, Self-aligning Packing Gland. Bulletin, illustrated, describes patented "John Crane" line for ammonia, air and gas compressors, reciprocating pumps and engines, which has established a record in maintenance saving; specifications given. Crane Packing Co., 1800 Cuyler ave., Chicago, Ill.

Corrugated Type Expansion Joints, directed flexing, self-equalizing, Bulletin No. 100, briefly describes and illustrates various kinds of Badger packless expansion joints; history; how to select right type for a given problem; prices, dimensions and weights. E. B. Badger & Sons Co., Boston, Mass.

Du Pont Carbonate Remover. Folder discusses removal of carbonate from plating solutions; outlines chemical analysis of carbonates and results of tests conducted with solutions of cadmium, copper, zinc, and silver. E. I. du Pont de Nemours & Co., Wilmington, Del.

Electric Fans and Fan Parts. Folder, company's line of equipment in this line listed, with complete specifications. Emerson Electric Mfg. Co., St. Louis, Mo.

Flexible Coupling. Type RCB, improved, for connecting shafting in line, Book No. 1545, gives dimensions, ratings, and other data. Link-Belt Co., 519 N. Holmes ave., Indianapolis, Ind.

Float Switches, CR2931, for use with automatic pumping equipment for water-level control, for either tank or sump operation. Bulletin GEA-67E, specifications. General Electric Co., Schenectady, N. Y.

Flow Meters. Folder, illustrated, demonstrates economies effected in power production by use of these meters in metering steam, water, oil, and other fluids. Brown Instrument Co., Phila., Pa.

Glass Lining. Mid-Winter, 1938, equipment and service magazine for dairy, food, beverage, and chemical process industries, devoted to new trends in use of glass lined equipment in these fields. Pfaudler Co., Rochester, N. Y.

Isco News. March, 1938, buyers of chemicals and allied lines will be benefited by the many opportune ideas and helpful information contained therein. Innis, Speiden & Co., 117 Liberty st., N. Y. City.

Kisco Cool-Circle-Ator Table. Illustrated leaflet, new method of air recirculation and cooling; of interest to office and factory managers. Kisco Co., St. Louis, Mo.

Micromax Pneumatic Control. Catalog N-00B, air-actuated control, explains simplicity and directness of action achieved in developing a complete, automatic control to embody company's Micromax recorder; illustrated; extensively applied in oil refining industry and equally adaptable in a wide variety of applications in the process industries. Leeds & Northrop Co., 4901 Stenton ave., Phila., Pa.

Nickel in the Brass Foundry. Bulletin No. 404, method of foundry procedure for production of pressure tight castings in 30 per cent. cupronickel is described; photographic illustrations of castings made under various conditions included. International Nickel Co., 67 Wall st., N. Y. City.

Nickelsworth. First Quarter, 1938, brevities on lastest developments in nickel and nickel alloy field. International Nickel Co., 67 Wall st., N. Y. City.

Oil-immersed Magnetic Switches, CR7006, for installation in corrosive atmospheres, Bulletin GEA-1590C, lists features and specifications. General Electric Co., Schenectady, N. Y.

Osmodor Bases. Leaflet, announcing 45 odor bases available in this range. Schimmel & Co., 601 W. 26th st., N. Y. City.

Oxy-Acetylene Tips. March, 1938, features review of money saving applications of the oxy-acetylene process in the fabrication and maintenance of equipment for quarrying, handling, and processing rock and rock products. Linde Air Products Co., 30 E. 42d st., N. Y. City.

Patterson Mixers. Bulletin, discusses principles of mixing; describes and illustrates mixers suitable for liquids of both high and low viscosity. Patterson Foundry & Machine Co., East Liverpool, O.

Photoelectric Relays. Bulletin GEA-2516, five standard G-E relays made in eleven different models described. General Electric Co., Schenectady, N. Y.

Portable Electric Instruments, Model AP-9 for general-utility commercial testing, Bulletin GEA-2011A, line includes voltmeters, milliammeters, ammeters and wattmeters. General Electric Co., Schenectady, N. Y.

Pot Furnaces. Folder, operating data and illustrations of typical installations of pot and forging furnaces and air heaters. Standard Combustion Co., Toledo, O.

Protective Colloids and Emulsions. Booklet, valuable summary of technical data and uses of these products, with directions and formulas for use; fills an ever-increasing demand for information on emulsifying agents and specialty colloid chemicals, and helps the chemist choose for a particular problem, prices listed. Beacon Co., 89 Bickford st., Boston, Mass.

Push Button Stations, and other CR2940 manual electric controls for use in control circuits of magnetic controllers, Bulletin GEA-2473, descriptions and illustrations. General Electric Co., Schenectady, N. Y.

Recording Instruments, for reducing production and maintenance costs, Bulletin GEA-2635, features dramatized in rotogravure style. General Electric Co., Schenectady, N. Y.

Research-Illustrated. March, 1938, transmission-lubrication edition, interesting knowledge to be gained from subjects discussed. E. F. Houghton & Co., 240 W. Somerset st., Phila., Pa.

Robertson Reminders. Vol. VI, No. 1, latest developments and installations of Robertson equipment. John Robertson Co., 121 Water st., Brooklyn, N. Y.

Schimmel Scientific Report. 1937 edition, for those interested in essential oils and aromatic chemicals, book in its standardized form presents an enormous array of facts, figures and findings under department headings. Those wishing to secure a copy should write company for details on securing same. Schimmel & Co., 601 W. 26th st., N. Y. City.

Sealing of Corrugated and Solid Fibre Containers, by J. D. Malcolmson, in booklet form, probably first authoritative complete book on this subject; covers all kinds of closures and is generously illustrated. Robert Gair Co., 155 E. 44th st., N. Y. City.

Simple Methods of Analyzing Plating Solutions. Fourth edition, 1938, outstanding feature is that methods described, while technically correct for commercial control of solutions, do not require a trained chemist to operate them; many useful charts and tables have been added to this edition. Hanson-Van Winkle-Munning Co., Matawan, N. J.

Solenoid-operated Valves, CR9507-A1A and A2A, for remote or automatic control of the flow of liquids; Bulletin GEA-1423A, specifications. General Electric Co., Schenectady, N. Y.

Sphinx Paste. Folder, of special interest to printers, telling why this adhesive is applicable to their particular problems. Arabol Mfg. Co., 110 E. 42d st., N. Y. City.

Steam-Jet Ejectors. Single, two- and three-stage, for removing air, gas, or vapors from condensers and vacuum chambers in industrial processes. Bulletin No. 9046, explains application and characteristics; illustrates operation and arrangement of all types with either surface or barometric precoolers, inter- and after-condensers. Ingersoll-Rand Co., 11 Broadway, N. Y. City.

Super Plater. Folder, details simple and economical process of electroplating developed for general use in the home and innumerable other places; plates all metals with exception of stainless steel and aluminum; ten standard plastic plating solutions are announced as available. Nickel-Chromium Plating Corp., 1000 S. Michigan ave., Chicago, Ill.

The Clean-Up. April, 1938, monthly house organ giving pertinent advice on company's line of garden chemicals and how to use them. C. B. Dolge Co., Westport, Conn

The Houghton Line. February-March, 1938, features: "Recession and the Road Back"; also company's products. E. F. Houghton & Co., 240 W. Somerset st., Phila., Pa.

The Laboratory. Vol. 9, No. 4, diversified laboratory hints. Fisher Scientific Co., 711 Forbes st., Pittsburgh, Pa.

Tungsten Electrodeposit Processes. Booklet No. 433, complete discussion tungsten and its technological aspects as related to this new process which is accomplished through use of Tunxten Dry Concentrates, manufactured by company. Tungsten Electrodeposit Corp., Barr Bldg., Washington, D. C.

Valves, Valve Parts, Pumps and Castings, made from acid and heat-resisting steel; Catalog and Price List, photographs included. Pioneer Alloy Products Co., 16601 Euclid ave., Cleveland, O.

Equipment News

New Westinghouse Sections

The new Industrial Department recently announced by Westinghouse to meet changing conditions in industrial markets will consist of six industry sections with managers as follows: Leslie M. Gumm, Manager, Metal Working Section, in charge of electrification of steel mills and automotive plants; J. S. Parry, Jr., Manager, Mining Section; Q. M. Crater, Manager, Petroleum and Chemical Section; J. H. Jewell, Manager, heads a new section known as Public Works and Communications Section. Included in its scope are public works, communications, amusements and relations with architects and consulting engineers whose major work identifies them with the above industries. G. D. Bowne, who has been Manager, General Mill Electrification Section, continues in that relationship. Included in this section are important industries such as paper, textile, food and rubber. J. R. Fulton continues as Manager, Marine Electrification Section.

New Chemicals for Industry

A digest of products and processes

Compounds for Dyeing and Printing

By Heron Wood

IF the range of chemicals which come under consideration for use in the dyehouse or print works is reviewed, a group of compounds whose development has been recent and important in both dyeing and finishing is outstanding. These are the hydrosulfites and the hydrosulfite-formaldehyde compounds, whose history has not yet been adequately treated (with the exception of Diserens' book in French on "Progress in the Development of the Vat Colours"), and whose constitution is inadequately understood by the practical man. Without these compounds, as they are available to-day, the more interesting applications of the vat colors in dyeing and printing might have been impossible.

The hydrosulfites are the salts of hydrosulfurous acid having the formula $H_2S_2O_4$, and it was at first thought that the production of sodium hydrosulfite, for example, proceeded according to the reaction:

$Zn + 3NaHSO_3 = Na_2SO_3 + ZnSO_3 + NaHSO_2 + H_2O$.

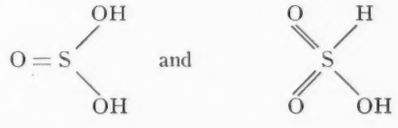
Sodium hydrosulfite was, therefore, represented by $NaHSO_2$. Bernthsen, however, concluded that the formation of sodium hydrosulfite on reduction of sodium bisulfite with zinc was correctly expressed by the reaction:

$Zn + 4NaHSO_3 = ZnSO_3 + Na_2SO_3 + Na_2S_2O_4 + 2H_2O$

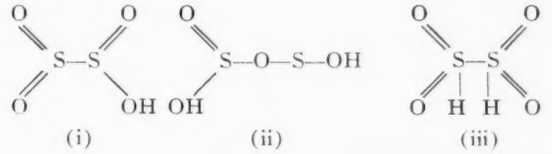
the formula for the hydrosulfite, therefore being: $Na_2S_2O_4 \cdot 2H_2O$.

To-day it is admitted that sodium hydrosulfite is a salt of a disulfonic acid, according to the following reasoning:

Just as for sulfurous acid we have two possible arrangements, namely,



so, for hydrosulfurous acid, we have three, as follows:



(i) (ii) (iii)

and as in hydrosulfurous acid the sulfur, it has been shown, must be joined directly to hydrogen, formula (iii), viz., the disulfonic acid must be the one from which the hydrosulfites are derived.

The industrial process for the manufacture of sodium hydrosulfite is based on the reduction of the bisulfite by zinc, the reaction being carried out in practice by reacting the zinc with sodium bisulfite in presence of sulfurous acid. The zinc sulfite and the sodium hydrosulfite form a double salt, insoluble in water, so that the product is then treated with milk of lime in order to decompose it. In the process the zinc and sulfurous acid are eliminated. Addition of a solution of common salt now precipitates the hydrosulfite in the form of crystals with two molecules of water of crystallization.

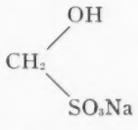
These are only stable in the very dry state. In solution, sodium hydrosulfite decomposes very easily, atmospheric oxygen causing the formation equally of bisulfite or bisulfate.

The stability in air of hydrosulfite obtained by saturating its aqueous salt with sodium chloride is poor, and sufficient stability is only obtained by dehydration. The hydrated crystals are brought to a more or less elevated temperature, either in their medium of formation or after filtration, in presence or not of a dehydrating agent such as caustic soda. It is reported, however, that one large concern, which prepared the anhydrous salts of hydrosulfurous acid by precipitation with common salt and subsequent heating in vacuo in presence of an inert gas or ammonia, was unable to apply the resulting compound in mordant printing owing to the extreme ease of decomposition of the sodium hydrosulfite in solution. The stability was improved by using a mordant compound of sodium hydrosulfite crushed with glycerine and caustic soda, two earlier commercial products (Eradite B and Rongalite B) being based on this formula.

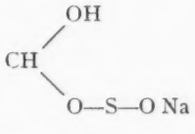
A great step forward was made by the discovery of the combination of sodium hydrosulfite with formaldehyde. It dates back to 1902, and is due to several chemists working independently. C. Kurtz, for instance, recommended the addition of formaldehyde to a color containing the solid hydrosulfite, and the resulting combination being stable, it was used to mordant paranitraniline red. Independently, E. Zundel remarked that a combination of marked stability was obtained by treating the hydrosulfite with formaldehyde.

However, in 1900, the Farbwerke de Hoechst had pointed out the improvement in the stability of printing colors (pastes) produced with bisulfite and powdered zinc, when formaldehyde was added; while even earlier Pellega and Zuber recorded the idea of producing the hydrosulfite formaldehyde of zinc by addition of formaldehyde to a mordant with powdered zinc and bisulfite.

As regards the constitution of these compounds, it has been shown that when formaldehyde acts on sodium hydrosulfite, an equimolecular mixture of two bodies is formed. The first is the bisulfite of sodium formaldehyde, which is a salt of oxymethanesulfonic acid:

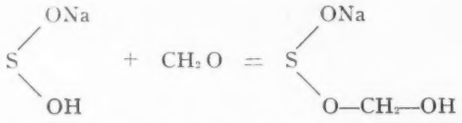


The second is the sulfoxylate of sodium formaldehyde, a salt of oxymethanesulfinic acid:

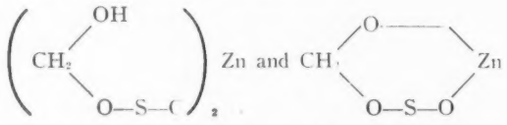


The first possesses no mordant power, but the second is a powerful reducing agent. The hydrosulfurous acid being a mixed anhydride of sulfurous and sulfoxylic acids, a satis-

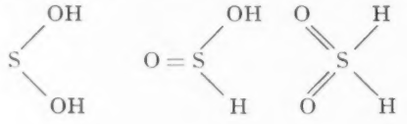
factory explanation is given of the formation of the oxymethanesulfonic and oxymethanesulfinic acids. With the formaldehyde the sodium sulfoxylate gives the sulfoxylate of sodium formaldehyde:



The oxymethanesulfonic acid is monobasic, but the oxymethanesulfinic acid is dibasic and, therefore, gives two series of salts, of which those of zinc are known:



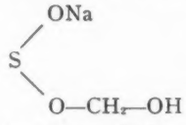
Three structures can be imagined for the sulfoxylic acid, a symmetrical, a dissymmetrical and a sulfinic acid form:—



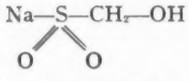
Considerations of Structure

The symmetrical structure does not seem to fit the case of the aldehydic compounds. Of the other two, if the sulfoxylic acid has the sulfinic structure it ought to be able to form, by oxidation, the sulfonic acid. It has been shown, however, that on reacting with iodine, the sulfonic group is never formed, but the sulfuric acid instead. However, working with permanganate at 0° C. in presence of magnesium chloride it has been possible to obtain the oxymethanesulfonic acid. To-day, there are two interpretations of the constitution of the aldehyde-sulfoxylic compounds.

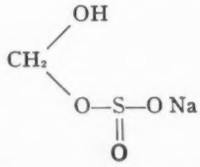
(1) This interpretation derives from the symmetrical form above by esterification, and gives the structure:



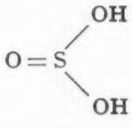
(2) That derived from the sulfinic acid form gives:



With the bisulfite the formaldehyde gives a sulfurous ester of formula:

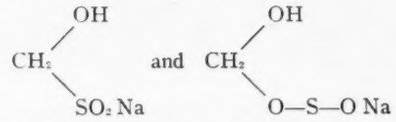


deriving from the sulfurous acid with the symmetrical formula, viz.:



The conception of a sulfurous ester, therefore, is the one generally adopted to-day for the combination of bisulfites with aldehydes.

The commercial development of these compounds followed on lines which have been carefully traced by L. Diserens. The first products which were sold were equimolecular mixtures of:



and included Hydrosulfite NF, Hydralite A and Rongalite C. The proprietary compounds were prepared either by adding formaldehyde to sodium hydrosulfite or by reduction in an acid medium of the aldehyde-bisulfite compound, using powdered zinc. The sodium hydrosulfite formaldehyde is transparent in aqueous solution into sodium bisulfite formaldehyde and sulfoxylate formaldehyde.

It was the B.A.S.F. which first succeeded in making the sodium sulfoxylate formaldehyde, according to the author quoted, in the almost pure state, and in 1905 issued Eradite C, and later Rongalite C. The sulfoxylate formaldehyde was separated from the bisulfite compound by fractional crystallization in water and dilute alcohol. According to a later patent, sodium sulfoxylate formaldehyde can be obtained by treating sodium hydrosulfite with formaldehyde in presence of caustic soda:

$$Na_2S_2O_4 + CH_2O + NaOH = NaHSO_3 . CH_2O + Na_2SO_3.$$

One process used at present industrially consists in forming the hydrosulfite of zinc formaldehyde, starting from zinc dust, in aqueous suspension, sulfurous anhydride and formaldehyde at 80° C. After reaction a small quantity of zinc is added, then, by double decomposition with soda a sodium salt is formed which is filtered and evaporated in vacuo.

Three modern compounds on a formaldehyde sulfoxylate basis are, therefore: (1) Formosul CP_3CW, CL, water-soluble powders which are strong reducing agents, used for stripping and discharging textile materials and in printing with vat colors; (2) Redusol Z or Zinc Formosul, neutral and basic salts of formaldehyde sulfoxylic acid, used for stripping and discharging dyed textiles; and (3) Leucotrope O.W., which is dimethylphenylbenzyl ammonium chloride and its disulfinate. This product forms salts with leuco vat dyes and is used for white and orange discharges on indigo and for stripping vat dyes. Abstracted from *Chemical Age*, Jan. 29, '38, p. 85.

Reclaiming Process

A reclaiming process (D.R.P. 654,217), in which phosphatides dissolved either in oil or in water are added to ground old rubber, after which the mixture is heated in steam for about four hours at four atmospheres, is said to produce unusually good results.

Cottonseed Research

Chemists whose research converted cottonseed, formerly a waste crop, into more than a score of marketable products including cosmetics, salad oil, rayon and writing paper, valued annually at $200,000,000, are seeking more uses of the seed, according to a report of progress in the chemical industries of Texas issued by the Dallas-Fort Worth Section of the A. C. S.

Chemistry's use of cottonseed has been great, but the potentialities are even greater. Some fields which chemists plan to explore in their search for more uses are: Conversion of cottonseed oil into an unsaturated or quick-drying oil for paint; research into vitamin B and vitamin G content of cottonseed flour and cottonseed meal, with particular reference to its possible value in combating pellagra; commercial possibilities of furfural production from cottonseed hulls, for use in refining gasoline and motor oils, for furfural derivatives in plastics, and for synthetic resins; further research into use of linters in chemical field to meet increasing competition from wood pulp and other sources of cellulose; development of more knowledge of the metabolism of the simple fats in cottonseed oil; more complete knowledge of the structure of the protein molecule of the cottonseed; exploration of the possibilities of xylan, which composes a large part of the nitrogen-free extract of cottonseed hulls and yields, upon hydrolysis and xylose. Many of the possibilities of this saccharine concentrate are yet to be explored.

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SOLVENT NEWS

Reg. U. S. Pat. Off.

April ★ A Monthly Series of Articles for Chemists and Executives of the Solvent-Consuming Industries ★ 1938

Improves Lacquer By Heating Tung Oil In Presence of Sulphur

WASHINGTON, D. C.—Conversion of tung oil into a non-drying oil capable of imparting outstanding properties to nitrocellulose lacquers and compatible with common lacquer solvents, plasticizers and resins, is claimed in a patent issued here.

The preparation of the tung oil involves heating between 250 and 400 deg. C. in the presence of a small amount of sulphur or selenium (or mixtures of the two). The temperature and heating period are varied depending on the type of tung oil used.

Following the heat treatment, air is blown through the oil for about 15 minutes. As a result of the sulphur treatment, the inventors claim, the drying properties of the oil do not reappear during the blowing process.

A typical lacquer formulated with a substantial proportion of the processed oil can, they explain, be applied over an old lacquer coating without lifting or wrinkling.

Alcohol-Gum Solution Stops Printing Offset Without Use of Heat

WASHINGTON, D. C.—In a new method for preventing offset in printing, an alcoholic solution of gum arabic is sprayed over the sheets as they emerge from the press, according to a recent patent.

Many printers now spray a "molten" material which solidifies at room temperature. The patent claims that "by changing the sprayed liquid to solid particles by drying instead of congealing, it is possible to avoid . . . providing heat . . . which is troublesome and objectionable in connection with a printing press."

A typical composition which permits the use of a fine spray and yields minute particles is given as 15 parts of U.S.P. gum arabic, 45 parts of water and 40 parts of alcohol.

Adding one part of gum tragacanth, the patent continues, "increases the viscosity and surface tension of the liquid and consequently increases the size of the drops and dried particles. . . . Other natural or synthetic gums having the characteristics of gum arabic . . . may be substituted."

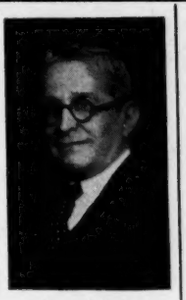
Shellac Imports Lag In First Two Months of '38

Total imports of shellac and seedlac during the first two months of 1938 was far behind the same months of 1937, figures released by the Shellac Importers Ass'n. reveal. Only 29,170 bags (each 164 lbs. net) were imported during January and February, 1938, while 47,106 bags were brought in during the first and second months of 1937.

The statistics also show that the imports of seedlac dropped more rapidly than shellac. In the 1937 period, shellac represented 44.5 per cent of the total imports, while in 1938 it represented 58.3 per cent.

J. L. Rivet Succeeds Pfeifer

J. L. Rivet, well known to alcohol buyers in the Southern territory where he has served for many years, was appointed manager of the New Orleans division effective March 1st. Mr. Rivet succeeds Leon Pfeifer who retired.



Leon Pfeifer

Leon Pfeifer Retires; U.S.I. Manager 18 Years

NEW ORLEANS, La.—Leon Pfeifer, manager of U.S.I.'s New Orleans sales division since 1920, retired on March 1 under the U.S.I. retirement plan.

With headquarters at New Orleans, Leon was well known as a result of his long and active record in the industrial alcohol industry. He held a number of responsible positions over a period of 33 years, during which he did much to promote the use of industrial alcohol.

He served as secretary and treasurer of the International Distilling Co. in 1903. Subsequently, he became president of the U. S. Industrial Alcohol Co. of Louisiana. In this post and other ones he carried forward the fight to have industrial alcohol plants enjoy the same privileges granted other industrial units.

In later years he was vice-president of the International Distilling Co. and the Louisiana Distilling Co., U.S.I. subsidiaries, until their transfer to the U. S. Industrial Alcohol Co. of W. Va. in 1917.

Multi-colored Plastics

Plastics of contrasting colors are now being produced in a single molding operation, according to a recent report. The new process, it is claimed, enables the production of phenolic and urea molding combinations with a predetermined surface design.

Predict More Uses for Improved Hansa Yellows

Expert Calls Them "Tomorrow's Common Colors"; U.S.I. Pioneers Production of Intermediates

Because the trend is toward greater light-fastness and brilliance of shade, a vastly larger field is predicted for Hansa Yellows, according to a leading authority writing in a recent issue of the "American Ink Maker." In fact, he declares, they are probably tomorrow's common colors. U.S.I. feels that its pioneering in the development of intermediates for these colors has done much to further this trend.

With the production of acetoacetanilid, one of the most vital intermediates, real progress was made. In succeeding years U.S.I. chemists developed a domestic supply of another intermediate, acetoacet-o-chlor-anilid.

Acetoacet-o-toluidid Now Available

A more recent development resulted in the addition of acetoacet-ortho-toluidid. Similar in many of its properties to the other acetoacetarylamides, acetoacet-ortho-toluidid is expected to expand manufacture of a wider range of Hansa yellow shades.

Like acetoacetanilid and acetoacet-o-chloranilid, it may be coupled with diazotised meta-nitro-para-toluidine, para-chlor-o-nitraniline or similar products to give a variety of yellows.

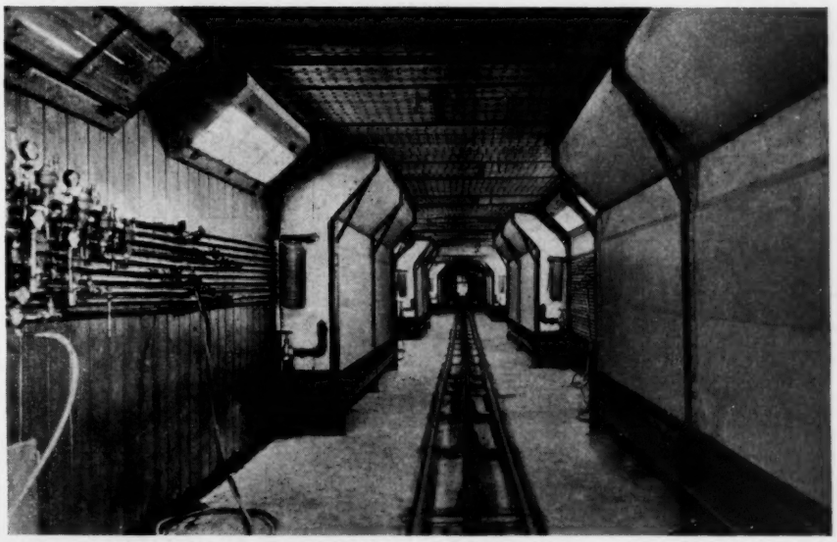
Pure Intermediates Essential

Some of the more common shades are Hansa G, 3G, 5G and 10G (See Jan., 1936, *Solvent News*). But these do not exhaust the possibilities, since the skill of the color maker and variation of conditions will permit other modifications.

Color makers, however, emphasize that purity of the essential intermediates is of paramount importance. Sponsored by long experience in the manufacture of other dyestuff intermediates, diethyl oxalate, ethyl

(Continued on next page)

Tunnel Spray Booths for Continuous Automobile Painting



Far different from the time-consuming finishing methods that used to require 20 to 30 days for a good job, is this painting production line in a Detroit, Mich., auto plant. It consists of six down-draft hydro-filter spray booths in one continuous conveyor line. Filtered air enters through the perforated ceiling and fumes are carried off through vents near the floor. *Courtesy R. C. Mahon Co.*

ADVERTISEMENT—*This entire page is a paid advertisement.*

APRIL ★ **SOLVENT NEWS** ★ 1938

Prepare Pliable Resin By Esterifying Copal Gum With Butyric Acid

BRUSSELS, Belgium — Butyro-copal, an esterification product of copal resin, similar to aceto-copal but more easily prepared, is described in a recent report published here.

The ester is a resinous, pliable and elastic material with a softening point near 70 deg. C., an acid number of 139, a saponification value of 255 and an iodine number of 97.8. Because it is easily soluble in such solvents as ether, isobutyl alcohol, amyl alcohol, ethyl alcohol and trichlorethylene, the modified resin is expected to have many of the practical applications of aceto-copal, the report states.

The method of preparation cited for butyro-copal depends upon the refluxing of 100 parts of lump congo with 50 parts of technical butyric acid for several hours. The excess butyric acid is distilled off.

Uses Dibutyl Phthalate To Stabilize Lubricant

ELIZABETH, N. J. — Dibutyl phthalate, properly thickened with polyvinyl acetate or other suitable thickening agents, can be used satisfactorily as a lubricant "capable of withstanding high temperatures without carbonization and possessing good lubricating and viscosity characteristics," it is revealed in a patent granted to an inventor of this city.

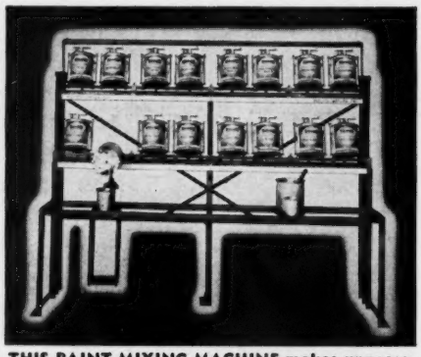
Combination of the thickened dibutyl phthalate with a mineral lubricating oil and with suitable soap ingredients yields a wide variety of lubricants, ranging from fairly viscous oils to greases, it is claimed.

The wide range of properties obtained with polyvinyl acetate is shown by the inventor in a table, which is abstracted below.

A suitable blend for a lubricating oil cited in the patent papers is:

Coastal Mineral Oil	80%
Dibutyl phthalate	15
Polyvinyl acetate	5
[**Dibutyl phthalate has been manufactured by U.S.I. for many years.**]	100%

	Saybolt vis./100	Saybolt vis./210	Viscosity index	Flash °F.	Pour °F.	Conradson carbon %
N-dibutyl phthalate	57.5	34		310	—50	.003
Thickened with:						
5% polyvinyl acetate (Sample A)	304	65	144			
10% polyvinyl acetate (Sample A)	995	139	134	315	—30	1-837
20% polyvinyl acetate (Sample B)	21,600	1,692	124		15	
2.5% ethyl cellulose (medium viscosity	963	80	79			
5% ethyl cellulose (high viscosity)	7,596	276	89		5	
5% benzyl cellulose	609	68	92	330	—20	
5% nitro cellulose	675	83	118			
30% thickened linseed oil (thickened 18 hr.)	854	178	143			
2% resin from polymerized diolefines	189	50	136			
10% glycerol phthalate resin	84	37				



THIS PAINT MIXING MACHINE makes unnecessary an inventory of hundreds of shades since, from 16 base tinting colors a large number of shades can be mixed, the manufacturer states. The equipment consists of 16 one-gallon cans each having a cast lid with an inbuilt agitator; a mixing can on a sliding tray; four gauges and a master formula book.

Predict More Uses For Improved Hansa Yellows

(Continued from previous page)

acetoacetate, sodium ethyl oxalacetate, etc., U.S.I. chemists have been able to maintain production of Hansa Yellow intermediates within very narrow specifications.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

Mildew-proof mill white paint said to contain a non-yellowing fungicide which kills the parasitic spores yet does not affect the brushing or smoothness of the finished film, was announced recently. According to the manufacturers, the paint is particularly suited to plants operating under high temperatures and humidity. **(No. 81)**

U S I

An adhesive for bonding metal to wood or glass, and synthetic plastic materials to almost any non-porous material has been introduced. It has been used successfully for fastening metal printing plates to wood or metal bases without nailing, according to the manufacturer. **(No. 82)**

U S I

Rust solvents designed for removing severe corrosion without any metal loss or with extreme etching action were recently announced. Five broad types, each composed of different acid and solvent combinations and strengths are available, it is said. **(No. 83)**

U S I

A new emulsifying and dispersing agent for water paints is said to have the following advantages, among others: Uniform dispersion of pigments, fillers and oil or resin. Better and more permanent paint film. Greater resistance to washing. Smoother surface. Low cost. **(No. 84)**

U S I

A new paint deodorant is described as a "compound of pure aromatic chemicals and essential oils which imparts a definite and permanent odor-neutralizing effect." It is said to dissolve readily in all paint mixtures in the recommended proportions of one pound of deodorant to 2,800 pounds of the average paint mixture. **(No. 85)**

U S I

A special grade of Japan oil for mixing house paints or undercoaters is claimed to minimize penetration by the oils of the paint so that the paint film dries stronger and more resistant to checking, cracking and scaling. The product is said to be especially valuable in paints for covering absorbent wood surfaces. **(No. 86)**

U S I

A wetting and dispersing agent, said to be particularly effective where resistance to formation of insoluble soaps or stability to acid or alkali is a requisite, has been introduced. The product, it is claimed, will disperse carbon black sufficiently well to pass through filter paper. **(No. 87)**

U S I

A new adhesive in paste form, said to bond paper to water-proofed fabrics, is now available. It will also make labels adhere to cans and paper to waxed surfaces, according to the manufacturer. **(No. 88)**

U S I

Gold ink which will not dry out on the rollers and plates of printing presses but which will dry speedily and without offset on the paper stock, was introduced recently. The ink is packed in a duplex can; the varnish in one section and the bronze powder in the other. **(No. 89)**

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New Form of Magnesium Carbonate

Production of a new form of magnesium carbonate, differing in crystalline structure from the conventional substance, which has the property of producing a greater transparency in rubber than has ever before been obtained, is announced by Keasbey & Mattison Co., Ambler, Pa. Reports from several manufacturers indicate that use of "Clearcarb" has resulted in rubber of greater transparency, increased tensile strength and modulus, with a decrease in cost. It has a constant refractive index of 1.525.

Alcohol-proof Lacquer

W-1007, new high grade, gloss wood lacquer, which has excellent resistance to alcohol, is being made by Rudd Lacquer & Sealer Corp., 80 Cliff St., New York City. It is heavy-bodied and may be reduced in proportions of two parts of lacquer to three parts of thinner to regular spraying viscosity.

Colored Metallic Surfaces

An electrolytic process which makes it possible to color metallic surfaces without the use of dyes or pigments, giving them an inherent brilliance and metallic lustre, or a soft egg-shell finish as desired, is announced by Philip Sievering, Inc., 199 Lafayette St., New York City. Innumerable color combinations can be obtained, and the colors are said to be light fast.

Control of Onion Fly with Calomel

Satisfactory control of the onion fly may be obtained by treatment of the onion seed, before planting, with an equal weight of calomel. Method described in *Journal of the Ministry of Agriculture*, Feb., '38; trials carried out at Horticultural Research Sta., Cambridge, England.

Color Plating Process

A process for coloring metallic surfaces without use of dyes or pigments has been developed by United Chromium, Inc., 51 E. 42 St., New York City. An inherent brilliance and metallic lustre or soft egg-shell finish is imparted to surface.

Self-Emulsifying Oil

A colorless, self-emulsifying oil is being manufactured by Haas-Miller Corp., Phila., Pa. Product contains no free fatty acid and less than one-half of one per cent. moisture; is odorless, stainless and non-oxidizing.

Abrasive for Glass Beveling

An improved abrasive for glass beveling and edging, lens roughing and all other glass jobs where silicon carbide grain is used, is announced by Norton Co., Worcester, Mass. New product is known as "I. R." Crystolon and is easily distinguished by its iridescent appearance. It has been thoroughly tested in leading glass shops, and it was found that it cuts fast, and breaks down very slowly, thus having long life.

Titanium Dioxide Process

A titanium dioxide process has been developed by an engineer in Osaka, Japan. Raw material is a by-product from the treatment of vanadium ores. *Chemical Age*, Feb. 19, '38, p. 149.

Tinning Flux

Blitzstone, tinning flux, recommended for use in sheet mills, for timing industrial products, such as castings, or retinning, etc., is being offered by American Solder & Flux Co., Wayne ave. and Berkley St., Phila., Pa. It is available in liquid form, solution having a gravity of approximately 50° Bé. In this form it can be used both as a dipping flux and as a top cover for the surfaces of the tin bath. It has the advantages of: producing brighter, smoother and more uniform surfaces; elimination of costly redipping operations; proper blending and careful balancing of the ingredients resulting in a more active and efficient fluxing material.

Teaseed Oil Cake as Pesticide

Teaseed oil cake is reported to be finding application in China as a pesticide for which purpose the cake is boiled with water and the mixture poured over the plants or soil. *Chemical Age*, Feb. 19, '38, p. 152.

Ethyl Cellulose in Varnishes

Addition of ethyl cellulose is a most effective way of raising the viscosities of pontianak spirit varnishes. Results were proved by recent experiments in the laboratories of American Gum Importers' Ass'n.

Glycerin by Fermentation of Molasses

Production of glycerin by fermentation of molasses is reported under way by Formosa Sugar Mfg. Co. of Japan. *Chemical Age*, Feb. 19, '38, p. 152.

New Use for Indium

The rare earth metal, indium, is being used as plating for bearings to make them last longer and resist oil corrosion better, according to *Research and Invention*, March, 1938, p. 4.

Smoke and Soot Eliminator

Carbo-Combusto is a chemical compound developed to react on impurities found in coal, which cause soot and other uncombusted matter to cling to boiler tubes, etc. Manufacturer, Berry Mfg. Co., 2818 Spring Grove Ave., Cincinnati, Ohio, claims it increases combustion, destroys soot and fly ash, and that its use in industrial plants effects a saving of 15 to 25%, depending on the B.T.U. of the fuel used. A saving in tube repairs and replacement is said to be possible, due to the fact that the compound deposits a minute metallic coating, combating corrosion and insulation caused by soot.

Wear-resisting Alloy

A wear-resisting cast alloy containing principally cobalt, chromium, and tungsten, known as Crobalt, is being manufactured by Michigan Tool Co., Detroit. Alloy is highly resistant to abrasion, heat and all types of corrosion; it may be welded or brazed on hard or soft steel. It is said that it is being used as a cutting metal, particularly in the automotive industry, and to possess cutting characteristics midway between high-speed steel and cemented tungsten carbide.

Improving Inferior Tobacco

Report has been made by the American Consul, Frankfort, to the Bureau of Commerce, that the recent process introduced in Germany for the improvement of inferior heavy grades of tobacco has been making considerable progress of late. It will probably be adopted eventually for the treatment of the whole German output of heavy grade tobacco. Process has been tested exhaustively and found to be suitable for preparation of smoking tobaccos from grades of tobacco hitherto only considered applicable as raw material for production of nicotine for insecticide purposes. A further advantage of process is said to reside in the fact that it is applicable to the tobacco in its first preparation stages. *Chemical Trade Journal*, Jan. 21, '38, p. 50.

Resin Adhesive

A new phenolic resin adhesive, announced by General Plastics, No. Tonawanda, N. Y., is known as 5116 Resin Adhesive and is of interest to manufacturers where cost is secondary to a satisfactory solution of their bonding problems. In solution in a hydrocarbon solvent, material has exceptionally high bonding strength. It is particularly efficient in bonding asbestos to sheet steel; rubber to metal or cellulose acetate materials; plastic molded parts; porcelain enameled parts; Cellophane or treated papers to steel, copper wire or wood. The following advantages are claimed: unaffected by water, moderate heat, alkalies and mild acids; used as a coating, it withstands a 50 per cent. caustic soda solution indefinitely; retains its bonding strength up to 100° C. Softening point is between 115° and 120° C. (ASTM).

Iodine from Natural Gas

A company has been formed in Japan for the purpose of extracting iodine from natural gas. *Chemical Age*, Mar. 12, '38, p.210.

Black Phosphorus

A new kind of black phosphorus, produced from the white at high temperatures and pressures, is reported by Dr. Robert B. Jacobs, of Harvard University. A violet variety of the element is also mentioned. The new black variety will not change back into the other common forms, but can be changed to the violet form. Dr. Jacobs in his experiments worked with pressures up to 12,000 atmospheres and temperatures of 200° C.

Water Soluble Resin

Hydroresin A, a water soluble resin, is described by manufacturer, Glyco Products Co., 148 Lafayette St., New York City, as being a light brown viscous liquid with high adhesive properties and is very slow drying. When water is added to it no decrease in viscosity or lack of clarity is noticed until the amount of water is about 70 per cent. of the weight of the resin. Increasing the amount of water gradually thins down the solution which becomes milky, but which can readily be cleared up by the addition of alkali. It is completely soluble in alcohol, and small percentages of toluol can be added without affecting the clarity of the product. It blends with waxes, oils, rosin, shellac, latex, casein, glue, etc., forming compounds with many interesting properties.

Distyrene Production Abroad

Distyrene, a white, free-running powder, is being manufactured and sold by The Distillers Co., Ltd., in Great Britain. It is said to be the only brand of polystyrene made in that country.

Plastic Printing Type

A German process for manufacture of printing type embraces use of polystyrol synthetic resin, instead of the customary lead and tin. Like type metal the new plastic type can be re-melted and re-cast as new for use again. Compared with lead, it offers advantages of superior hygiene for printing workers and, in addition, is of much lighter weight than lead type, enabling lower charges for transportation, storage and general costs. From a report by the American Consulate General, Frankfort.

New Lime Composition

A revolutionary lime composition for the buffing industry, called Wax-Pak Li-Vac, is announced by Bruco Products, 5712 12th St., Detroit. Great savings in operating time and material are claimed, thereby lowering production costs. Product is packed in waxed paper, a new innovation. It is vacuumized, compressed, and formed in one operation at a constant temperature, thus producing a denser, more adhesive, and efficient composition. Another advantage is that it can be used without unwrapping.

New Tertiary Amine

A new tertiary amine, which is substantially non-volatile and since it is amphoteric, forms salts with acids or alkalies, is being marketed by Rohm & Haas, 222 W. Washington Sq., Phila., under the name Hyamine A, and is a new member of the series of organic amines and quaternary ammonium compounds which this company is producing. It forms water-soluble salts with inorganic acids and oil-soluble salts with fatty acids, rosins, and naphthenic acids. It is an excellent solvent for a wide variety of compounds, and it is particularly recommended for neutralizing acid and preventing corrosion in oil systems. As an ingredient in paint removers it is unusually effective and it also acts as a stabilizing agent in petroleum oils. As a tertiary amine, it reacts with a wide variety of compounds and is of interest in the synthesis of new disinfectants and pharmaceuticals.

Film-rupture Strength of Lubricants

An ideal substance for incorporating with lubricants used at very high pressures has not yet been found, although the author E. A. Evans (*Journal Soc. Dyers & Colourists*, Feb., '38, p. 69) has examined thousands of compounds. It has long been known that sulfur compounds and many metallic soaps, when added to a mineral or glyceride lubricant, have a favorable effect on its film-rupture strength. Recently, it was found that the dissolution of 5 per cent. of di-(3-carbomethoxy-4-hydroxyphenyl) thioether in mineral oil, increases the film-rupture strength of the oil to 15,000 lb. per sq. in. This value is equal to that of rape oil or wool wax, and the treated oil does not develop any major corrosion difficulties.

Putty, Primer, and Varnish

A metal furniture putty which may be applied to steel, aluminum, and other metals, is being marketed by Bissell Varnish Co., Bridgeport, Conn. Its chief use is to smooth out imperfections in metal caused by spot welds, file marks, and small holes. Another development is a gray primer of a neutral color for use under any color, which sprays to a perfectly smooth surface, bakes rapidly, rubs and sands easily and compels adhesion of the following coats. Company also has a new varnish almost water white in color which fills a long felt want for finishing materials which can be applied over grained work without changing the underlying color. Speed has been incorporated in the hardening time and it can be baked in one hour.

Water Repellent

Aridex HW, a water repellent designed for use on materials in which both repellency and body are desired is announced by du Pont. It is a special wax-aluminum salt emulsion with a high solids content and is particularly recommended for use on heavy cotton goods to give greater weight and a firm hand. It is useful on all types of cotton, linen, rayon and acetate fabrics.

Month's New Dyes

General Dyestuff has released the following: Diazo Brilliant Orange GGA Extra Conc. which, when diatotized and developed with Developer A, produces on cotton or rayon bright shades of a yellowish orange. It is said to be valuable for self shades as well as for brown combinations which must be dischargeable. Benzo Brown BA, direct dyestuff, which produces a very good union shade of a deep bluish brown on rayon-cotton, leaving acetate very clear and staining animal fibres only slightly. Indanthren Olive Green GG Powder Fine for Dyeing is a homogeneous vat dyestuff of the IN series, producing shades much yellower than Indanthren Olive Green BA. On account of its resistance to outside exposure, it is recommended for dyeing awning stripes. Fast Wool Blue EG, acid blue, brought out by I. G. and marketed by General Dyestuff, levels well, even from a sulfuric acid bath, and produces on wool greenish blues of good fastness to light. It is of interest to the hat trade, as it is of better fastness to hot water than other level dyeing acid blues generally used. Solidogen B is a product recommended for improving fastness to water of direct dyeings.

Althouse Chemical Co., Reading, Pa., has released a color card entitled: "Azoanthrene Fast Colors for Package Machine Dyeing," which describes a series of dyes for rayon, cotton, silk or unions which are said to be faster to washing than developed colors. It is stated that the dyes become insoluble with the addition of Parathol, a new method of producing fast to washing colors.

A dyestuff which shows only a slight change under artificial light is announced by du Pont's Dyestuffs Division. Known as "Ponsol" Brown 2G Paste, it produces yellow shades of brown, and may be used alone or in combination for dress-goods, shirtings, curtains and similar materials because of its yellowish shade and its fastness properties. It has demonstrated a practical immunity to the majority of ordinary destructive agencies, and good dyeing characteristics, being suitable to cotton and rayon in all forms.

Chemical Specialties for Industry

A digest of new uses and new compounds

Industrial Uses of Animal Oils

By Benjamin Levitt

INDUSTRIAL uses are growing for the oils of several of the land animals, of which the most important in point of quantity of production is lard oil. There were 32,640,455 pounds produced in 1937, according to the U. S. Census.

Prime lard oil is the fluid expressed from white grease, an inedible lard. It is produced by "seeding" or graining the grease at 50° F., in trucks containing about 800 pounds of stock. By seeding is meant the crystallizing and settling out of the stearine. "Puds" are then made up by wrapping several pounds of the seeded grease in 6 oz. duck packages, placed on plates, layer on layer, and then pressed by means of a hydraulic press.

The darker grades of lard oil are produced in a similar manner, but from yellow or house grease, which has been given a preliminary purification by means of acid, to coagulate and precipitate albuminous matter and other impurities. The accompanying chart, showing the constants of the various materials herein discussed, was prepared by Robert Smith, Independent Mfg. Co., Philadelphia, to whom the author is grateful for the data at the bottom of this page.

Lard oil is used for illuminating purposes in lighthouses, ships, in miners' lamps and head lights of locomotives, for the penetrating effect upon fogs of its flame. It is free from the danger of explosion and does not thicken at low temperatures.

It is also used as a lubricant in thread cutting, because it has the property of clinging to the tool and to the metal being cut while its high flash point prevents smoking as the tool heats up. For similar reasons it is used by brass and copper manufacturers for drawing copper tubes and for lubricating dies.

U. S. Patent No. 1,367,428 covers a refrigerant base for the production of sulfur base cutting oils. It comprises a stabilized base of animal fat, sulfur and paraffin oil, capable of forming a permanent dilute solution of hydrocarbon mineral oil. It is produced by heating together at 350° F. woolfat or distilled wool grease 30% by weight; sulfur, 13%; lard oil, 26%; and 28° paraffin oil, 30%.

U. S. Navy specifications for mineral lard oil, to be used for machine cutting tool lubricant, are as follows:

Chemical Requirements:

a. Not less than 25% nor more than 35% fixed saponifiable oil.
b. Not less than 60% nor more than 70% mineral oil.
c. Not more than 5% free fatty acids, calculated as oleic.

Physical Requirements:

a. Specific gravity at 15° C. shall be about 0.90.
b. Flash Point (open tester) shall be not less than 180° C. (356° F.).
c. The viscosity at 100° F. (38° C.) shall be about 185, and at 48° C. (118° F.), it shall be 115.

Tests. Mineral lard oil shall pass the following tests:

a. Gumming. A saucer containing enough of the test oil to cover the bottom, shall be kept at a constant temperature of 120° C. for a period of 8 hours. There shall be no sign of gummy residue after removing the saucer and permitting it to cool gradually.
b. Corrosion: Strips of polished steel shall show no appreciable corrosion in two weeks' time when partly immersed in an emulsion of the oil, soda and water.

A 1% solution of sodium carbonate is used in making the emulsion.

Oberg, in "Heat Treatment of Steel," recommends an oil having the following properties, for tempering steel. Flash point 550° F., fire test 625° F., mineral oil 94%, saponifiable oil 6%, specific gravity 0.92. Lard oil may be used as the saponifiable portion of such oil.

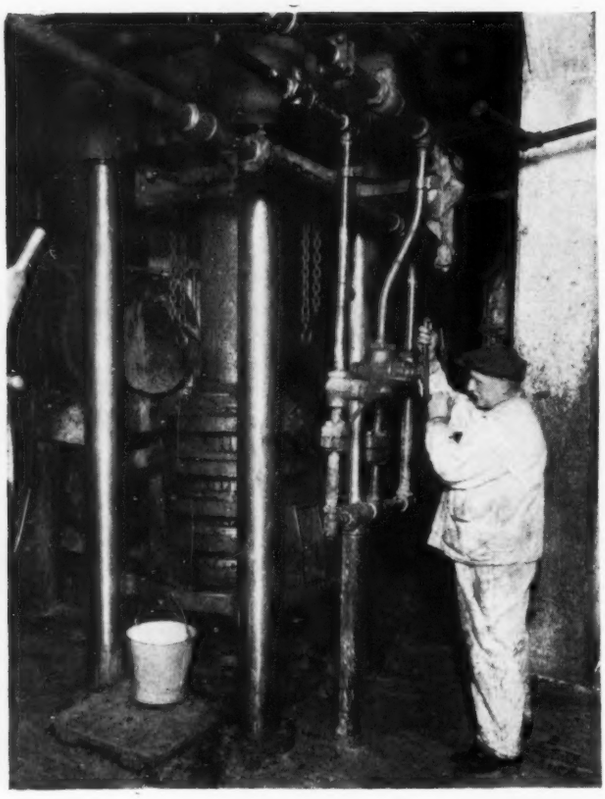
In textile treatment, lard oil is used chiefly for oiling wool. The following is a typical formula for this purpose: Lard oil, 4 gallons; water, 5 gallons; borax, 4 ounces. Dissolve borax in boiling water, and add lard oil, mixing thoroughly until emulsified. Use two gallons per 100 pounds of wool.

Neatsfoot Stock and Oil

The production of neatsfoot oil reached 5,160,700 pounds last year. This oil is made from shin bones and feet of cattle. The feet are cut off, washed and trimmed. The sinews are used for glue. The hoofs are removed and the bones are sawed. The bones are then cooked in an open kettle with boiling water to

Stock	*Acid*	*Color*	*Iodine No.*	*Sapon. Val.*	*C. T.*	*Pour °F.*	*Vis.@100°F. S.U.V.*	*Flash F.*	*Fire F.*	*Titer C.*
Prime Lard Oil	½%	1½ NPA	65–75	190–195	..	40	200–220	550	600	32–35
Ex. or O. P.	5%	3 NPA	65–75	190–195	..	45	200–220	500	550	32–36
No. 1 Lard Oil	20%	6 NPA	65–80	190 min.	..	45	230 max.	450 min.	500	32–36
Neatsfoot	1%	1¼ NPA	70–78	190 min.	20	..	210	550 min.	600	22–26
Neatsfoot	1%	1¼ NPA	65–75	190 min.	30	..	210	550	600	26–30
Neatsfoot Stock	1%	11 FAC	65–72	190 min.	..	..	.....	...	...	26–30
Acidless Tal. Oil	1%	2 NPA	50–60	192 min.	..	95	55 @ 210° F.	550	600	38–42
Choice Wh. Grease	4	13 FAC	68	192	...	..	.....	...	...	37–40.5
House Gr.	15	41 FAC	65–70	195	..	..	.....	...	...	39
Prime Packer's Tallow..	4	11 FAC	50	195	..	..	.....	...	...	41–43
Ex. N. Y. Tallow	6	13 FAC	50	195	..	..	.....	...	...	41–43
Special	12	19 FAC	50	195	..	..	.....	...	...	41–43

N.P.A.—National Petroleum Association.
F.A.C.—Fat Analysis Committee of the Amer. Chemical Society.



Photograph, courtesy Baldwin-Southwark Corp.

Press for separating tallow from cracklings.

separate the fat. From five to 10 hours' cooking is required, whereupon the fat is skimmed off the surface of the water, strained through cloth into a steam jacketed kettle and heated to 240° F. After maintaining that temperature for several hours, it is allowed to cool and settle a few hours longer. The oil is then drawn off and filtered through cotton flannel bags. The stock is then ready for shipment.

The stock as received at the oil refinery, or pressing plant, is "grained out" at 34° F. for about two weeks and then pressed. The first pressed neatsfoot oil is "export pure" which is the finest grade, having a cloud point of 16-18° F. This grade is used for fine leathers and for oiling watches and fine machinery.

The stearine from the first pressing is grained once more, and pressed again to produce 30° cold test neatsfoot oil. This grade is used by throwsters, in an emulsion with olive oil soap, or in its sulfonated form, with or without mineral, emulsified in water for soaking silk. It is also used as a base for knitting oils, combined with light mineral oil. This forms the so-called stainless needle oils, because they readily emulsify with alkalies or soap, which facilitates their removal from the fabrics.

Harness makers use it for softening leather, and linen mills use it on the spindles. Here are four typical formulae for using the oil on leather:

Waterproof Oil for Calf Leather—Half gallon each, of castor oil, sperm oil, neatsfoot oil and tallow.

Waterproof Finish for Calf Sporting Leathers—5 lbs., beeswax; 1½ gallons, neatsfoot oil; 3 gallons, boiled linseed oil. This makes a butter-like mass which is readily absorbed by the uppers.

Fat Liquor for Black Chrome Kid—4½ lbs., neatsfoot oil; 3½ lbs., olive oil soap; 2¼lbs., egg yolk; and 1 pint, glycerin.

Harness Oil—Tallow 10, neatsfoot oil 10, petrolatum 10, lamp black 1, turpentine or petroleum spirits, 4 gallons.

The stearine from the second pressing is used as tallow for soapmaking.

The 1937 production of tallow oil amounted to 9,712,502 lbs. Prime tallow is cooled at 85-90° F. for several days to grain thoroughly, and then it is pressed. It is then refined by heating to 165° F. and adding 18 Be' caustic soda in slight excess, to saponify the free fatty acids only. The batch is agitated for several minutes, and a little salt is added to facilitate the precipitation of the "foots" or soap stock. It is allowed to settle and the supernatant oil is drawn off by means of a draw pipe.

The stearine is sold for lubricant and for packing cylinders of heavy engines. Tallow oil is used by oil dealers as a basis for compounding cylinder oils.

The General Motors Corp. specifications for steam cylinder oils are as follows: The oils shall be homogeneous mixtures of acidless tallow oil and properly refined mineral cylinder stock, free from dirt, water, soluble acid or other extraneous matter.

The acidless tallow oil content ranges with the different types of cylinder oils from 5 to 6 %, with a maximum free fatty acid on the finished oil.

Here are several other production figures for the year 1937, which are pertinent to this industry—Inedible animal stearine, 19,731,369 lbs.; inedible tallow, 430,010,221 lbs.; white grease, 43,598,180 lbs. All production figures given here are from the preliminary reports of the U. S. Department of Commerce.

Latex Stabilization Compounds

Rex Compounds, developed for use in the saturation and stabilization of latex, as well as for use in latex compounds and naphtha rubber compounds, are announced by Leather Finish, Inc., 233 Commercial st., Malden, Mass. Mixed with latex they are said to be especially suitable for coating and other purposes.

Air-drying Aluminum Synthetic

An air-drying aluminum synthetic, called No. 66E-656 Aluminum Synthetic, which dries tack free in 20 minutes, is announced by Stanley Chemical Co., East Berlin, Conn. Material is of exceptional brilliance and has excellent adhesion, durability and weathering qualities. It has phenomenal flow and dipping characteristics and imparts a bright, smooth finish in a one-coat job, drying free from sags, runs or drips. Long baking at extreme temperatures is unnecessary.

Anhydrite as Cement Retarding Agent

The following results of research by cement technologists (U. S. Bureau of Mines) in the value of anhydrite as a cement retarding agent are given in *Chemical Trade Journal,* Dec. 31, '37, p. 586.

Anhydrite, the anhydrous form of calcium sulfate, inevitably occurs associated with gypsum, and the percentage varies widely, depending on nature of deposit and depth of working. Used alone, anhydrite has a definite effect, but is less effective than pure gypsum as a retarder; about four times as much pure anhydrite as pure gypsum of equal fineness being required to produce the same retardation. Although anhydrite is intrinsically less effective than pure gypsum, mixtures of anhydrite and gypsum can be as effective as pure gypsum, and, under suitable conditions, mixtures containing 25 to 50 per cent. anhydrite should be as effective as pure gypsum.

The Non-Metals Division of the Bureau, at its Eastern Experiment Sta., College Park, Md., investigated the problem several years ago. The first study was concerned with the chemical behavior of calcium sulfate in relation to time of setting. As a result, chemical relations were revealed and the important effect of catalytic amounts of water vapor was recognized. The effectiveness of anhydrite relative to gypsum was investigated as to setting, tensile strength, and compressive strength. An important phase of the study was the conditioning of the materials so that they adsorbed slight amounts of water vapor such as they would in plant-mill practice.

Caulking Compounds

By Charles F. Mason, Ph. D.

SINCE pre-historic days plastic substances have been used for filling crevices between assembled parts of buildings, as evidenced by the presence of tars and self-setting cements among the relics of the Egyptians. As civilization advanced a group of substances were developed to fill such needs. Some were self-setting hydraulic cements, and their modifications, which are concrete and mortar. Later the gypsum products were discovered, and then the putties.

Only the last two products found use in readily accessible crevices where they could be replaced when necessary, and it was upon these, especially the putties, that the architects, construction engineers and contractors depended up to about a decade after the turn of the century. Since that time there has been a growing demand for a wide variety of such compounds to meet peculiar needs, the nomenclature of which consists of names characteristic of the industry like expansion joints, lagging, flashing, and waterproofing compounds.

The need for such materials is evident when one considers the recent trends in building construction, which create demands for more window space, more fire resistant materials and speed in erection. About three-quarters of the exposed area of modern factory buildings, where mechanical operations are conducted, consists of glass set in steel frames which, at the time of construction, are encased in mortar, thus ignoring the law of nature that metals expand appreciably with fluctuations in temperature.

After these structures have settled and been exposed to the elements for a few years, they are expensive to heat and maintain, unless easily applied materials are available for filling the crevices. Skyscrapers in our large cities vibrate under normal weather conditions, and in extreme cases the mortar between the bricks has been known to open up and allow rain to enter. Leaking cornices, water tables, projecting belts and skylights are common.

One example of a specialty in the class of caulking compounds is worth mentioning here. In large cities the majority of subway stations are located directly under busy thoroughfares, over which thousands of pedestrians pass every hour of the business day, and all joints between the concrete slabs of the sidewalk must be water-tight. Due to the demands of union labor a compound had to be developed to meet the specifications of clinging to the joint during vibration, of lasting as long as the concrete, of not emitting odors when melted, of not sticking to pedestrian's shoes, and lastly of a certain range of cost.

This need was met with a wax, rosin, oil mixture which is melted by a gasoline torch just before use. After pouring into the clean crevice it hardens quickly, and the excess can be shaved off with a hot tool.

These compounds are manufactured largely by paint producers, asphalt compounders and chemical specialty dealers in two general forms; namely, pastes and viscous liquids. Another group, classed under expansion joints, is preformed either into sheets, blocks, or plates ready for use principally upon concrete roads. This group consists of asphalt filler combinations and an extensive discussion of them is outside the scope of this article.

The plates are applied with trowels into easily accessible crevices which approximate one-quarter to one-half inch wide and one-half to one inch deep. In some cases the crevice is packed with oakum where fire regulations permit, and this or other packing acts as a skeleton to support the compound during setting. The viscous liquids are forced by hand operated pumps into inaccessible crevices which range from horizontal to vertical and are of widely varying dimensions. To date this class has been of the difficult ones because it lies in the joint in loops, and being compounded with oils presents the difficulty of staining.

The general requirements are listed below.

1. Ready for application.
2. To cling to all walls.
3. To remain elastic and follow the movement of the wall as it vibrates.
4. To harden quickly at the surface.
5. To be adaptable to addition of colors for matching.
6. Not to stick excessively to tools.
7. To remain stable at the range of temperature.
8. To not stain adjoining parts of the crevice.

Although it seems impossible for at least five compounds to possess all these properties, the average dealer feels that five varieties upon his shelves can fill the needs of his customers. From the formulas listed below producers should be able to find combinations which will fill their needs in properties and prices.

1.	Whiting	20	
	Asbestine	30	
	Asbestos fiber	8	Paste form
	Aluminum powder	6	
	Linseed oil (boiled)	36	
2.	Whiting	12	
	Silica	17	
	Asbestos fiber	15	Viscous liquid
	Linseed oil (boiled)	30	
	Oil varnish	17	
	Varnoline	9	
3.	Linseed oil (raw)	30	
	Whiting	25	
	Water	21	Viscous liquid
	Glue (powder)	15	
	Soap chips	5	
	Stearic acid	4	

The glue and soap chips are dispersed in the water while hot and the stearic acid after melting is stirred in to form an emulsion. When this is complete the oil and whiting can be mixed in in successive order.

4.	Whiting	30	
	Linseed oil (raw)	60	Viscous liquid
	Oil varnish	6	
	Varnoline	4	
5.	Zinc oxide	16	
	Manganese borate	1	
	Linseed oil (boiled)	18	Paste form
	Gloss oil (8 lb. gal.)	18	
	Spar varnish (4.5-100)	18	
	Asbestine	14	
	Asbestos fiber	15	
6.	Petroleum asphalt	50	For roofs
	Whiting	50	
7.	Petroleum asphalt	75	For concrete
	Whiting	25	
8.	Gas tar	30	
	Fish oil	10	
	Manganese resinate	1	For decks of ships
	Naphtha	9	
	Linseed oil (boiled)	10	
	Whiting	40	
9.	Petroleum asphalt	45	
	Gilsonite	10	
	Kieselguhr	30	
	Linseed oil (raw)	10	
	Varnoline	5	

The gilsonite is heated until dark fumes begin to be evolved, the asphalt and oil are then added and, when cool, the filler is ground in. The varnoline can be retained for thinning during grinding.

10.	Rubber latex (35%)	50
	Ammonium linoleate	10
	Linseed oil (raw)	10
	Whiting	30

This should not be attempted except by one who has had experience with rubber latex. The compound will be very resilient and waterproof after the water in the latex has evaporated or been absorbed.

At this point it would not be out of place to comment upon requests of contractors for new specialties in this line, one of which is a transparent for glass in skylights, where panes of glass overlap in shingle fashion and the putty used retards the light. Another is one in varnish form which can be sprayed over brick surfaces and not be absorbed un-uniformly into the pores of the brick, but will dry quickly, be non-tacky and not harm the present color of the building.

It is obvious that although these and others not mentioned are big orders, they are not impossible, and can be satisfactorily solved only upon a scientific basis. These and the specifications heretofore mentioned can be solved for any one who is willing to pay the price of scientific investigation.

Water Resistant Dressing for Cleaners

An absolutely odorless, invisible, but effective stain and water repellent dressing for silks, woolens, and rayons has been perfected by Stainpruf Distributing Corp., 342 Madison Ave., New York City, for dry cleaners. Product is sold under name "Stainpruf."

Improved Counter Cement

An improved counter cement for use on both leather and fibre counters, adaptable for use under all but the most difficult conditions is mentioned in *Hide and Leather*, Mar. 5, '38, p. 20. Drying speed can be slow, medium, or fast as desired. Cement has shown excellent results on shoes lined with cloth or other porous material.

Hand Protective Creams

Two protective creams for the hands of industrial workers are being marketed by Davis Emergency Equipment Co., 55 Varick St., New York City. No. 1 cream is for protection of hands during work; and No. 2, for use after work.

Bowl Cleaner

Alonize, new bowl cleaner for bath and toilet fixtures, is said to dissolve scale and emulsify soil instantly. Manufacturer, Fuld Bros., 702 S. Wolfe St., Balto., Md., claims it contains no soap, but that its powerful foam "cracks" all greasy, scummy accumulations, holding them in emulsion while its quick bleaching element whitens.

Patching Material

Flex-O-Fix, a black plastic compound, having a latex base, has been developed by Frund Products Co., 43 E. Ohio St., Chicago, Ill. Product has adhesive properties, can be manipulated or spread when applied, and dries tough, elastic and waterproof. Flex-O-Fix has many uses: it can be used for electrical insulation, for setting glass, repairing umbrellas, tents, awnings and tarpaulins, for repairing rubber and canvas hose, as a patching material for linoleum, for filling joints and general caulking purposes, etc.

Solvents for Rust

A different type of rust solvent, known as Metal-Cleen, is being marketed by Nielco Products Co., 5421 Cicotte ave., Detroit, Mich. This variety of metal cleaners is based on a combination of active rust solvent acids called "Nielcacid." Metal-Cleen is composed of five series, each series representing a different acid combination. Each series has seven acid strengths, and each acid strength has three solvent combinations. All of the cleaners can be reduced with water 2 to 1, many of them 3 to 1, to give the utmost efficiency at the lowest possible cost.

Sock Lining Cements

Sock lining cements for the new types of synthetic lining materials which are soft and porous and hard to stick with ordinary cements have been developed recently, according to *Hide and Leather*, Mar. 5, '38, p. 20. These cements set up a strong anchorage in the fibres of the sock lining material and at the same time deposit a generous film on the surface to insure a strong bond on the innersole.

Vacuum Cement

A cement for vacuum furnaces which does not become brittle, adheres to any surface and can be re-used indefinitely, has been developed by Westinghouse Electric & Mfg., East Pittsburgh, Pa. Cement is solid at room temperature, but at higher temperatures becomes increasingly softer. It is highly tenacious and will stick to rough or smooth metal, glass and quartz surfaces to form vacuum-tight joints. Product can also be used as a paint by using carbon tetrachloride as a solvent. In this form it can be painted on, and a layer of the desired thickness built up.

Building Material Made from Resin

A building material made from synthetic resin is described in *Plastics* (1938, *2*, 16-18). Material is prepared from a highly viscous synthetic resin binder, which is made into a semi-coherent powdery dough with a pure silica filler; cement, lime, wood-flour and bitumen being entirely absent. The "dough" can be cold-pressed to give a material which will harden at ordinary temperatures to an extraordinary degree of toughness and strength; the hardening proceeds more rapidly at about 170° C. Among special applications of the new material is the making of jointless flooring.

Leather Adhesive

A leather adhesive composition is made from a solution of Celluloid and a resin in acetone with addition of a tannin extract obtained by subjecting oak bark and galls to extraction with acetone and methylated spirit. Castor oil, eucalyptus oil, or oil of mirbane may be added to the tannin extract during or after the extraction. E. P. 473,946 described in *Chemical Trade Journal*, Jan. 21, '38, p. 59.

Non-toxic Soldering Flux

An improved, quick acting, hard soldering and brazing flux, "Kwikflux," is being marketed by Special Chemicals Corp., 30 Irving Pl., New York City. Because of its low melting point, it does not limit the speed of brazing and hard soldering operations, and allows the operator to perform his work as soon as the solder starts flowing.

Dielectric Compositions

An insulating material has as its principal ingredients one or more halogenated aryl hydrocarbons or derivatives, together with a minor proportion of a compatible fixative material consisting of a nitrile compound, an amino compound or an unsaturated compound of the terpene and camphor class, which is capable of combining with hydrogen halide to form a non-corrosive material. The fixative may be benzyl cyanide or a halogenated benzyl cyanide, *e.g.*, trichlorbenzyl cyanide. Latter may be prepared by chlorinating toluene in the presence of an iron catalyst at 25–50° C. and then chlorinating in the presence of sulfur at 140–150° C., the trichlorbenzyl chloride produced being heated and agitated with ethyl alcohol, potassium cyanide and water. Tetrachlorbenzyl cyanide may be produced similarly. Alternatively, the fixative may be lauronitrile, benzonitrile, toluonitrile, or their chlorinated derivatives, aniline, naphthylamine, benzidine, aminoanthracene, aminophenol or their chlorinated derivatives, isoprene, citronellal, etc. The halogenated aryl hydrocarbons or derivatives may be chlorinated diphenyl, trichlorbenzene, chlorinated diphenyl oxide or chlorinated naphthalene. E. P. 473,441 outlined in *Chemical Trade Journal*, Jan. 21, '38, p. 59.

New Trade Marks of the Month

356,832. Consolidated Rendering Co., Boston, Mass.; Oct. 6, '34; fertilizers; use since Feb., '34.

372,579. Pacific Guano Co., San Francisco, Calif.; Dec. 12, '35; insecticides; use since Jan. 1, '35.

384,340. Solventol Chemical Prods., Inc., Detroit, Mich.; Oct. 14, '36; household and industrial cleaning compound; use since Aug. 20, '32.

384,341. Solventol Chemical Prods., Inc., Detroit, Mich.; Oct. 14, '36; household and industrial cleaning compound; use since Dec., '32.

385,796. Monsanto Chem. Co., St. Louis, Mo.; Nov. 20, '36; organic and inorganic aerogels, possessing marked heat insulating properties, having general use in the industrial arts; use since Apr., '36.

385,853. Marbon Corp., Chicago, Ill.; Nov. 21, '36; lacquer; use since Nov. 3, '36.

387,030. Chemische Fabrik R. Baumheier, Aktiengesellschaft, Oschatz-Zschollau, Germany (Chemische Fabrik R. Baumheier Kommanditgesellschaft); Dec. 22, '36; waterproofing compounds for treating textiles, paper, etc.; use since Aug. 10, '32.

387,474. Joe Perryman, Columbia, Ky.; Jan. 5, '37; soap powders; use since Dec. 8, '36.

388,371. Joseph A. Schulte, Jr. (Etsol Synthetic Products), Detroit, Mich.; Jan. 30, '37; household and industrial cleaning compound; use since Mar. 1, '36.

391,076. Lion Oil Refining Co., El Dorado, Ark.; Apr. 8, '37; lubricating oils; use since Feb. 27, '37.

391,578. Lion Oil Refining Co., El Dorado, Ark.; Apr. 20, '37; lubricating oils; use since Feb. 25, '37.

393,438. Metasap Chemical Co., Harrison, N. J.; May 29, '37; ingredient used as a lubricant base; use since May, '29.

394,044. Mikolite Co., Kansas City, Mo.; June 14, '37; heat insulating material in loose form or admixed with cement-gypsum plaster, asphalt, or the like; use since July 16, '33.

394,236. Liquid Veneer Corp., Buffalo, N. Y.; June 18, '37; lacquer and varnish; use since Dec. 28, '36.

394,242. Moth-O-Rize Co., Inc., Chicago, Ill.; June 18, '37; moth repellent preparation; use since Sept. 10, '36.

394,243. Moth-O-Rize Co., Inc., Chicago, Ill.; June 18, '37; moth repellent preparation; use since Sept. 10, '36.

394,366. Atlantic Research Associates, Inc., Newtonville, Mass.; June 22, '37; paints, paint pigments, and casein coating materials; use since Sept. 1, '35.

394,367. Atlantic Research Associates, Inc., Newtonville, Mass.; June 22, '37; paints and casein coating materials; use since Mar. 1, '37.

401,946. Phosphate Mining Co., N. Y. City; Jan. 15, '38; water softener; use since Jan. 5, '38.

396,068. The Freedom Oil Works Co., Freedom, Pa.; Aug. 6, '37; lubricating oils and greases; use since June 16, '25.

396,289. Erhard Zacharias (Usalco Merchandising Co.), N. Y. City; Aug. 11, '37; insecticides and insect powder; use since July 20, '37.

396,389. Dob-Ene Co. (Dobene Sales Co.), N. Y. City; Aug. 14, '37; compound for cleaning ophthalmic lenses and other glass surfaces; use since May 12, '36.

397,007. Star Chem. Co., Inc., Chicago, Ill.; Sept. 1, '37; wood and marble cement in stick form; use since Jan. 1, '13.

397,171. Barrett Co., N. Y. City; Sept. 7, '37; dry cleaning solvent; use since 1906.

397,757. Insel Co., Arlington, N. J.; Sept. 24, '37; plastic molding compositions; use since Jan. 15, '37.

398,014. Pyrogas Co., North Kansas City, Mo.; Oct. 1, '37; petroleum for providing household gas for cooking and lighting; use since May 19, '37.

399,350. B. F. Goodrich Co., N. Y. City, and Akron, O.; Nov. 5, '37; stop leak, solder and cleaner for radiators; use since May, '30.

402,013. Nobs Chemical Co., Los Angeles, Calif.; Jan. 17, '38; liquid metal paint; use since Oct. 15, '37.

399,370. Oxweld Acetylene Co., N. Y. City; Nov. 5, '37; non-metallic welding fluxes; use since Aug. 22, '33.

399,515. Phosphate Mining Co., N. Y. City; Nov. 9, '37; water softener; use since Oct. 28, '37.

399,517. Shell Oil Co., San Francisco, Calif.; Nov. 9, '37; motor lubricating oil; use since Oct. 20, '37.

399,690. Turco Prods., Inc., Los Angeles, Calif.; Nov. 12, '37; household and industrial cleaning compounds; use since Sept. 15, '37.

399,717. R. H. Macy & Co., Inc., N. Y. City; Nov. 13, '37; enamel and porcelain cleaner, soaps, polishes, cleaning fluids, etc.; earliest use since 1928.

399,775. Niacet Chem. Corp., Niagara Falls, N. Y.; Nov. 15, '37; sodium acetate; use since May 21, '37.

399,781. Soy Bean Processing Co., Inc., Westfield, Waterloo, Ia.; Nov. 15, '37; soy bean insecticides; use since Oct. 26, '37.

402,575. Michal Sienkiewicz, N. Y. City; Feb. 1, '38; solder; use since Jan. 2, '38.

399,941. Shoe Form Co., Auburn, N. Y.; Nov. 19, '37; plastic cellulose derivative, in sheet form; use since Aug., '37.

400,065. Carlos Montiel E., Caracas, Venezuela; Nov. 23, '37; disinfectant; use since Nov. 2, '33.

400,099. General Chemical Co., N. Y. City; Nov. 24, '37; cyanides; use since Oct. 13, '37.

400,118. National Co-Operatives, Inc., Indianapolis, Ind.; Nov. 24, '37; fly spray; use since 1929.

400,150. Fred C. Adams (Fred C. Adams & Co.), Chicago, Ill.; Nov. 26, '37; composition for water treatment; use since Dec. 8, '30.

400,165. Lehman Bros., Inc., Jersey City, N. J.; Nov. 26, '37; paints, varnishes, and paint enamels; use since 1935.

400,267. Andrew Wilson, Inc., Springfield, N. J.; Nov. 29, '37; liquid agricultural insecticides; use since Nov. 21, '32.

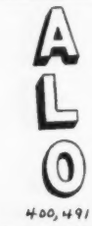
400,310. Potash Company of America, Baltimore, Md., Atlanta, Ga., and Carlsbad, N. Mex.; Nov. 30, '37; muriate of potash; use since Oct. 18, '37.

402,199. Onyx Oil & Chemical Co., Jersey City, N. J.; Jan. 21, '38; textile finishing compound; use since Dec. 12, '37.

400,330. American Colloid Co., Chicago, Ill.; Dec. 1, '37; finely divided bentonite; use since Apr. 30, '37.

† Trade-marks reproduced and described cover those appearing in the *U. S. Patent Gazettes*, Feb. 8, Mar. 1, 8, 15 and 22.

400,331



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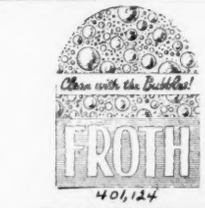

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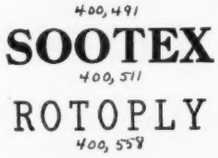

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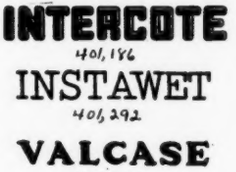

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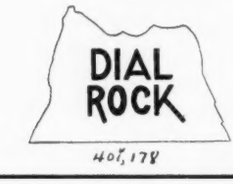

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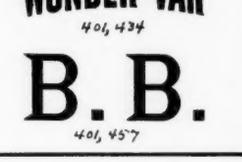

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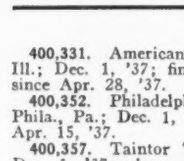

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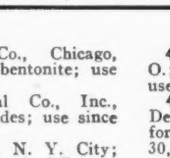

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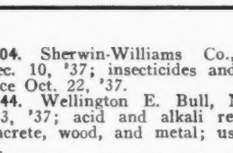

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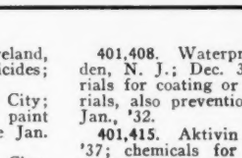

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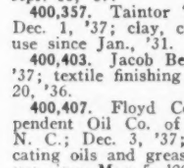

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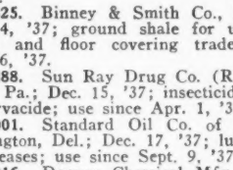

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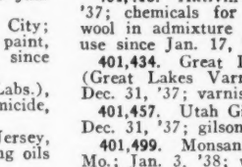

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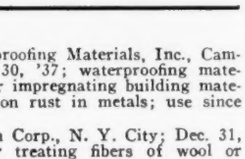

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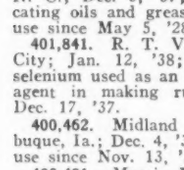

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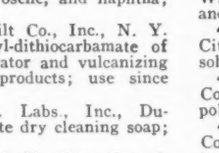

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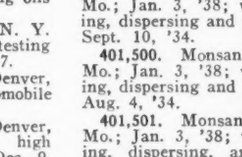

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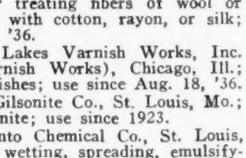

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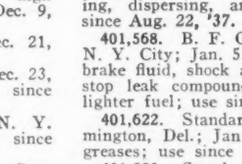

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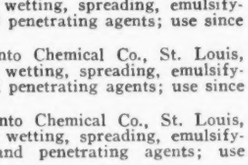


401,810

400,331. American Colloid Co., Chicago, Ill.; Dec. 1, '37; finely divided bentonite; use since Apr. 28, '37.

400,352. Philadelphia Chemical Co., Inc., Phila., Pa.; Dec. 1, '37; insecticides; use since Apr. 15, '37.

400,357. Taintor Trading Co., N. Y. City; Dec. 1, '37; clay, crude chalk, and cliffstone; use since Jan., '31.

400,403. Jacob Bendix, N. Y. City; Dec. 3, '37; textile finishing compound; use since Oct. 20, '36.

400,407. Floyd Commadore Forester (Independent Oil Co. of N. C.), No. Wilkesboro, N. C.; Dec. 3, '37; gasoline motor oil, lubricating oils and greases, kerosene, and naphtha; use since May 5, '28.

401,841. R. T. Vanderbilt Co., Inc., N. Y. City; Jan. 12, '38; dialkyl-dithiocarbamate of selenium used as an accelerator and vulcanizing agent in making rubber products; use since Dec. 17, '37.

400,462. Midland Chem. Labs., Inc., Dubuque, Ia.; Dec. 4, '37; paste dry cleaning soap; use since Nov. 13, '37.

400,491. Marcia Blier, N. Y. City; Dec. 6, '37; liquid aluminum cleanser; use since Nov. 27, '37.

400,511. The Kimball-Yoes Corp., Houston, Tex.; Dec. 6, '37; chemical preparation for eliminating soot and carbon scale from furnaces and boilers, preventing stack fires and the like; use since Aug. 20, '36.

400,558. I. F. Laucks, Inc., Seattle, Wash.; Dec. 7, '37; plywood; use since Nov. 30, '37.

400,605. Brainerd L. Mellinger (Overhaul Co.), Kansas City, Mo.; Dec. 8, '37; motor sealing compound; use since Mar. 1, '35.

400,637. Electro Ball Co., Inc., Dallas, Tex.; Dec. 9, '37; deodorants, disinfectants, antiseptics, and germicides; use since Dec. 2, '37.

400,642. Holbrook Mfg. Co., Jersey City, N. J.; Dec. 9, '37; scouring soap; use since Jan. 1, 1895.

400,674. American Disinfecting Co., Inc., Sedalia, Mo.; Dec. 10, '37; disinfectants, deodorants, insecticides, germicides, animal dips, and drain pipe cleaning preparations; use since 1925.

402,018. Pecora Paint Co., Phila., Pa.; Jan. 17, '38; plastic compositions used as cements and caulking compounds in building installations, including structural glass; use since Jan. 1, '37.

400,704. Sherwin-Williams Co., Cleveland, O.; Dec. 10, '37; insecticides and fungicides; use since Oct. 22, '37.

400,744. Wellington E. Bull, N. Y. City; Dec. 13, '37; acid and alkali resistant paint for concrete, wood, and metal; use since Jan. 30, '35.

400,825. Binney & Smith Co., N. Y. City; Dec. 14, '37; ground shale for use in paint, rubber, and floor covering trade; use since Nov. 26, '37.

400,888. Sun Ray Drug Co. (R-A-K Labs.), Phila., Pa.; Dec. 15, '37; insecticide, vermicide, and larvacide; use since Apr. 1, '37.

401,001. Standard Oil Co. of New Jersey, Wilmington, Del.; Dec. 17, '37; lubricating oils and greases; use since Sept. 9, '37.

401,016. Denver Chemical Mfg. Co., N. Y. City; Dec. 18, '37; dry reagent for testing solutions for sugar; use since June 4, '37.

401,025. Kactus Oil Prods. Co., Denver, Colo.; Dec. 18, '37; furniture and automobile polish; use since Nov. 1, '37.

401,103. Denver Fire Clay Co., Denver, Colo.; Dec. 21, '37; chrome neutral high temperature bonding mortar; use since Dec. 9, '37.

401,121. Texas Co., N. Y. City; Dec. 21, '37; cutting oil; use since Dec. 3, '37.

401,178. Craft Oil Co., Avoca, Pa.; Dec. 23, '37; lubricating oils and greases; use since Aug. 20, '37.

401,124. Winthrop & Ward, Inc., N. Y. City; Dec. 21, '37; dry cleaner; use since Feb. 25, '37.

401,145. Haas-Miller Corp., Phila., Pa.; Dec. 22, '37; textile weighting chemicals; use since Jan. 8, '36.

401,185. Interstate Paint Co., Chicago, Ill.; Dec. 23, '37; paints in paste form; use since Oct. 1, '36.

401,186. Interstate Paint Co., Chicago, Ill.; Dec. 23, '37; paints in paste form; use since Oct. 1, '36.

401,292. John Campbell & Co., N. Y. City; Dec. 28, '37; chemicals for use in dyeing industry; use since Oct. 10, '37.

401,294. Chapman Valve Mfg. Co., Indian Orchard, Mass.; Dec. 28, '37; compounds for fused salt baths used in heat-treating; use since Oct. 15, '37.

401,299. Dow Chemical Co., Midland, Mich.; Dec. 28, '37; insecticides and insecticidal compositions; use since Dec. 7, '37.

401,408. Waterproofing Materials, Inc., Camden, N. J.; Dec. 30, '37; waterproofing materials for coating or impregnating building materials, also prevention rust in metals; use since Jan., '32.

401,415. Aktivin Corp., N. Y. City; Dec. 31, '37; chemicals for treating fibers of wool or wool in admixture with cotton, rayon, or silk; use since Jan. 17, '36.

401,434. Great Lakes Varnish Works, Inc. (Great Lakes Varnish Works), Chicago, Ill.; Dec. 31, '37; varnishes; use since Aug. 18, '36.

401,457. Utah Gilsonite Co., St. Louis, Mo.; Dec. 31, '37; gilsonite; use since 1923.

401,499. Monsanto Chemical Co., St. Louis, Mo.; Jan. 3, '38; wetting, spreading, emulsifying, dispersing and penetrating agents; use since Sept. 10, '34.

401,500. Monsanto Chemical Co., St. Louis, Mo.; Jan. 3, '38; wetting, spreading, emulsifying, dispersing and penetrating agents; use since Aug. 4, '34.

401,501. Monsanto Chemical Co., St. Louis, Mo.; Jan. 3, '38; wetting, spreading, emulsifying, dispersing, and penetrating agents; use since Aug. 22, '37.

401,568. B. F. Goodrich Co., Akron, O., and N. Y. City; Jan. 5, '38; tar remover, hydraulic brake fluid, shock absorber fluid, cleaner-solder-stop leak compounds for radiators, and cigar lighter fuel; use since May 1, '37.

401,622. Standard Oil Co. of N. J., Wilmington, Del.; Jan 6, '38; lubricating oils and greases; use since Sept. 9, '37.

401,623. Standard Oil Co. of N. J.; Wilmington, Del.; Jan. 6, '38; lubricating oils and greases; use since Sept. 9, '37.

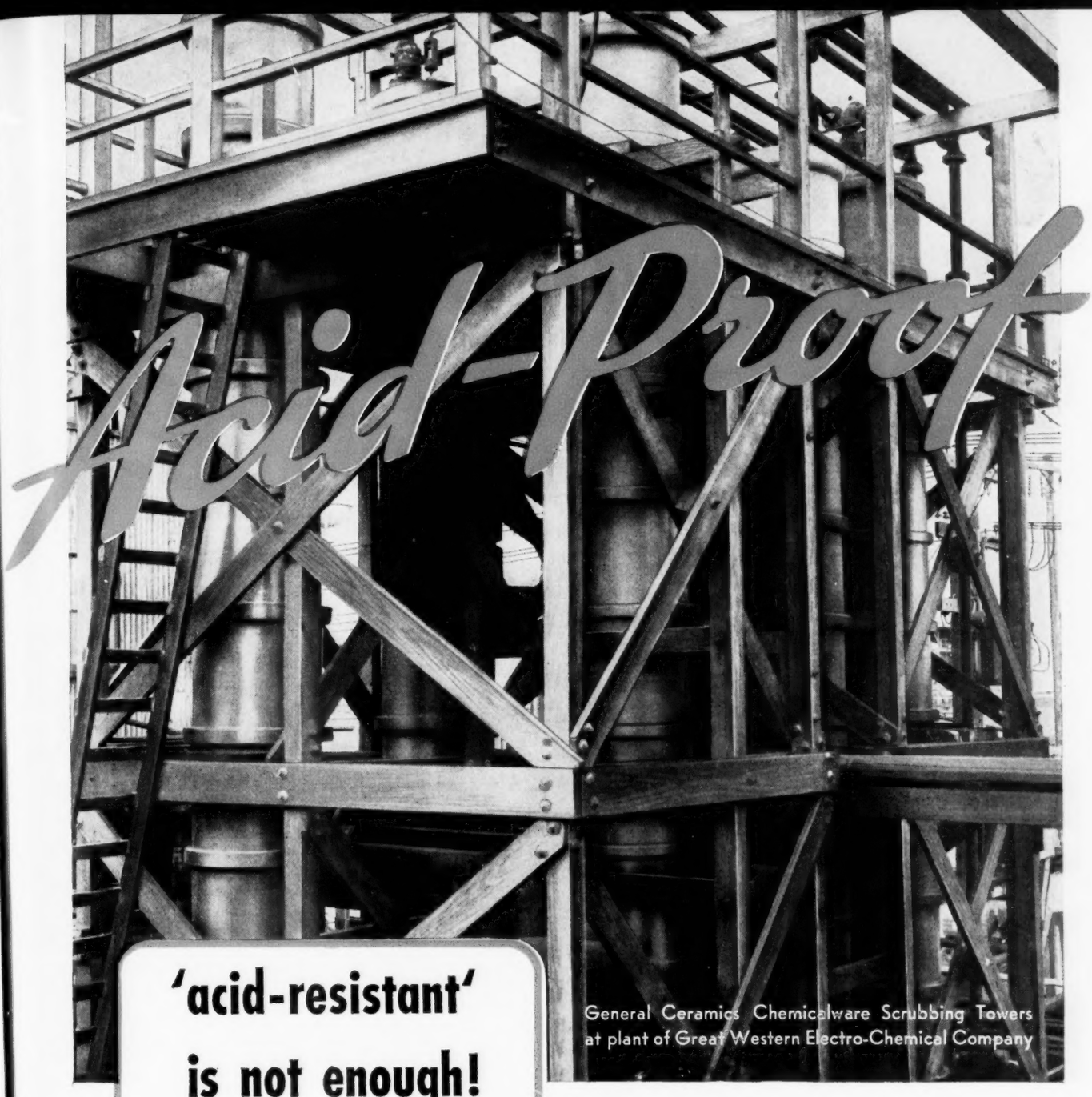
401,742. La Maison Products, Inc., N. Y. City; Jan. 10, '38; cleaning fluid; use since Nov. 30, '37.

401,745. I. F. Laucks, Inc., Seattle, Wash.; Jan. 10, '38; paints for brick, masonry, and concrete surfaces; use since Dec. 29, '37.

401,779. Hammond Paint & Chemical Co., Inc., Beacon, N. Y.; Jan. 11, '38; insecticide; use since Nov. 10, '36.

401,797. Standard Oil Co. of Calif., Wilmington, Del., and San Francisco, Calif.; Jan. 11, '38; asphalt and asphaltic compounds; use since Nov. 18, '37.

401,810. Deodor-X Corp., Boston, Mass.; Jan. 12, '38; germicide, deodorant, and disinfectant; use since Jan. 5, '38.



General Ceramics Chemicalware Scrubbing Towers at plant of Great Western Electro-Chemical Company

'acid-resistant' is not enough!

General Ceramics Chemical Stoneware is acid-proof

For handling industrial acids, General Ceramics Chemical Stoneware is more than merely acid-resistant, it is ACID-PROOF. All chemicals, hot or cold, with the exception of hydrofluoric acid, can be safely stored, piped or processed in General Ceramics Chemicalware without fear of corrosion or contamination.

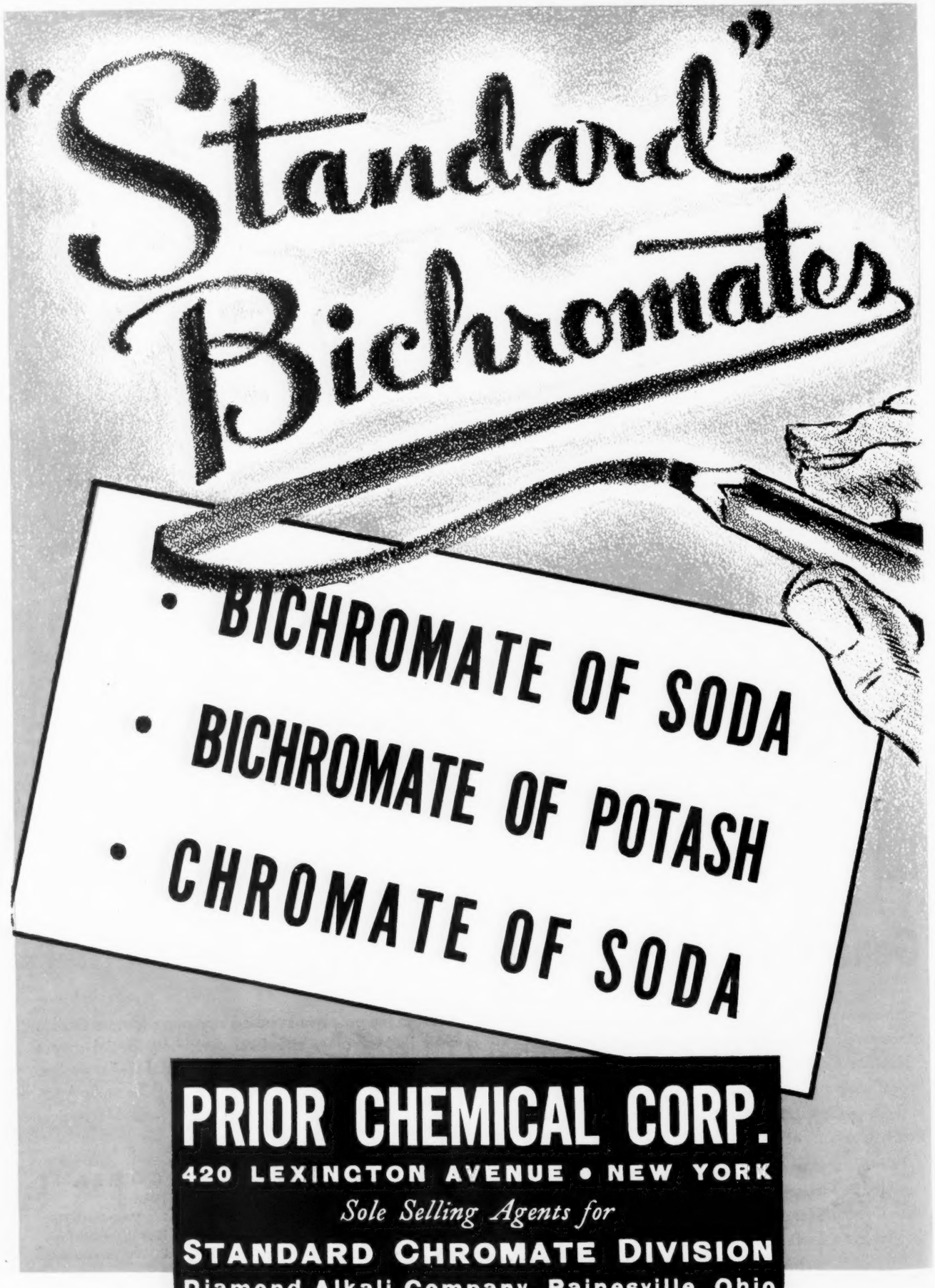
This attractive glazed-finish stoneware is unfailingly durable. Depreciation and replacement can be forgotten when General Ceramics Chemicalware is installed . . . and that means a better product at a lower processing cost.

Because the process of making stoneware is more flexible than that of other structural materials, special shapes cost little or no more than stock shapes of similar design. For detailed information about General Ceramics Acid-Proof Storage Vessels, Pipe, Fittings and Mechanical Equipment, address . . .

GENERAL CERAMICS COMPANY
30 ROCKEFELLER PLAZA, NEW YORK
BUFFALO: 306 Jackson Bldg. SAN FRANCISCO: 276 Monadnock Bldg.
CHICAGO: 208 South La Salle St. MONTREAL: 1009 University Tower
LOS ANGELES: 315 South Central Avenue TACOMA: Tacoma Bldg.

GENERAL CERAMICS COMPANY

GENERAL CERAMICS COMPANY
CHEMICAL STONEWARE


"Standard" Bichromates
• BICHROMATE OF SODA
• BICHROMATE OF POTASH
• CHROMATE OF SODA
PRIOR CHEMICAL CORP.
420 LEXINGTON AVENUE • NEW YORK
Sole Selling Agents for
STANDARD CHROMATE DIVISION
Diamond Alkali Company, Painesville, Ohio

Meet Some "Midlanders"

The Dow Chemical Company and Midland, Michigan, are synonyms in the minds of the chemical fraternity, and below are a group of the business executive staff whose names are known from coast to coast.

Here visitors are welcomed at the reception desk by Miss Minnie Keil.

President, Willard H. Dow at his desk.

"Dutch" — assistant general manager, A. P. Beutel, in charge of "the clearing house."

"E. W."—vice president, secretary and treasurer Bennett, known as the "Commodore."

"Joe"—assistant sales manager in charge of insecticides, J. A. Cavanagh.

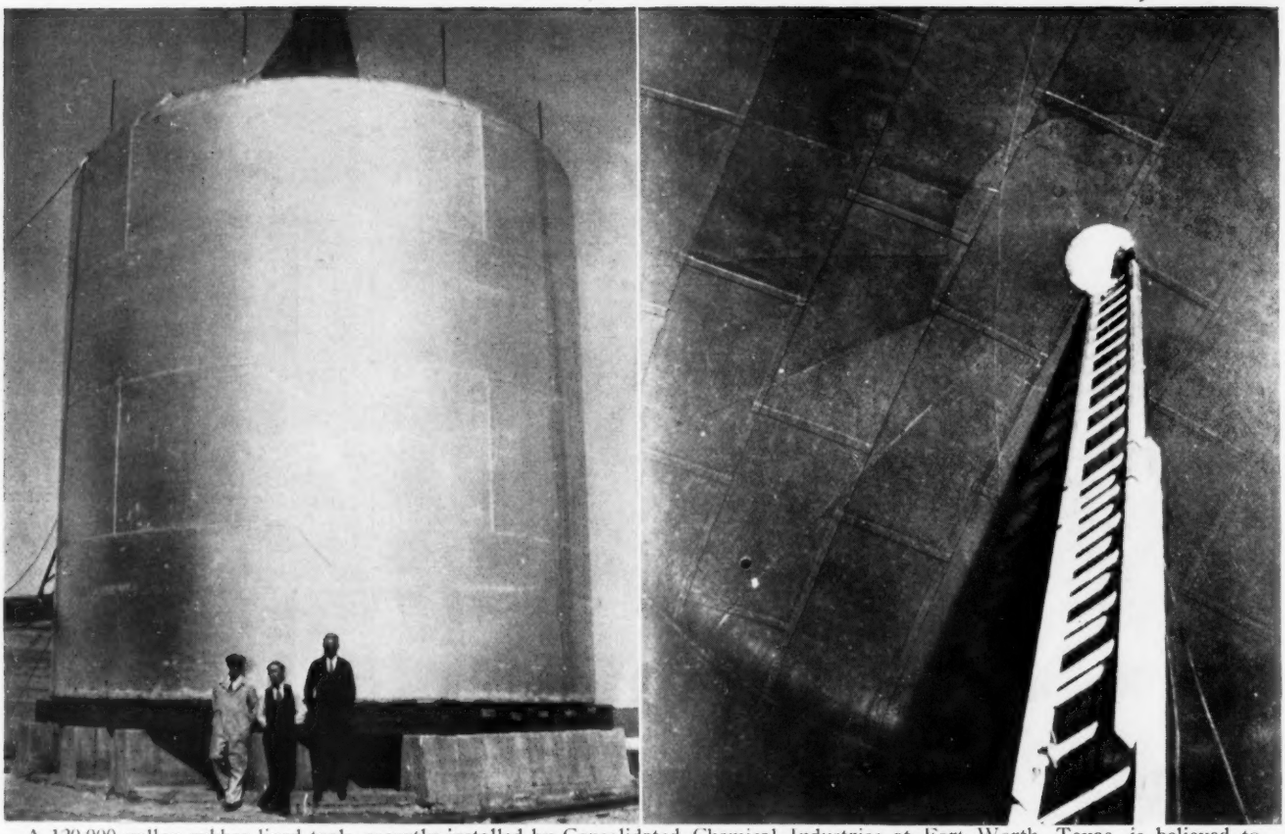
"Russ"—R. E. Curtis, assistant general sales manager, lieutenant to Leland Doan.

"Steve"—A. C. White, veteran trouble-shooter of the service department.

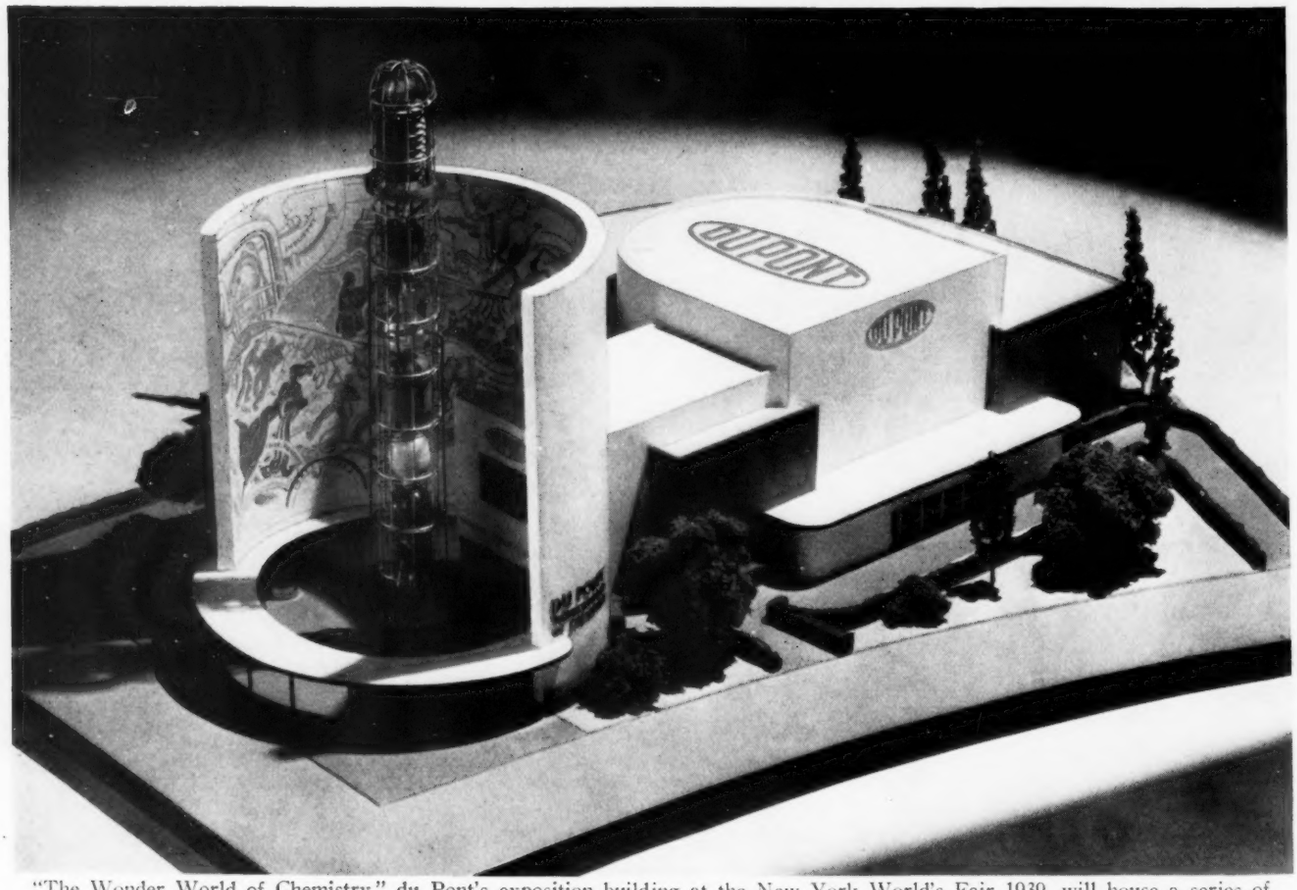
"Sam"—S. P. Nicholas, alias the Salt King.

"Sherm"—convention specialist, S. W. Putnam, assistant sales manager.

"Bill"—who signs the advertising contracts as W. F. Stumpfig and sells on the side.



A 120,000 gallon rubber-lined tank, recently installed by Consolidated Chemical Industries at Fort Worth, Texas, is believed to be the largest ever constructed for hydrochloric acid storage. It measures 26 ft. in diameter and is 25 ft. high. As noted from photograph at right, the tank is equipped with special built-in expansion joints to prevent cracking or bucking.



"The Wonder World of Chemistry," du Pont's exposition building at the New York World's Fair 1939, will house a series of exhibits dramatizing chemistry's contributions to every phase of social and industrial life. Among these will be a glorified laboratory to demonstrate the transformation of commonplace substances into luxuries. The symbolic mural painting on the semi-circular shell 70 feet high enclosing the entrance court will have figures almost 40 feet tall.

SHARPLES AMYLAMINES

THE AMYLAMINES ARE ENJOYING A RAPIDLY EXPANDING USE IN INDUSTRY AND RESEARCH

Sharples *Monoamylamine* serves in the manufacture of pharmaceuticals, dyestuffs, rubber accelerators, anti-oxidants, emulsifying agents, de-sizing agents for textiles, amylated acid amides, and a number of other organic products in which oil solubility is a factor. Monoamylamine itself is useful as a corrosion inhibitor and in the production of organic soaps.

Diamylamine reacts to form various derivatives which serve as rubber vulcanization accelerators, flotation reagents, dyestuffs, and corrosion inhibitors. It is also a solvent for oils, resins and some of the cellulose esters.

Triamylamine, in addition to serving as an excellent corrosion inhibitor, shows promise as an insecticide for the control of onion thrips, red spiders, cucumber beetles, and other troublesome insects.

Sharples Amylamines enter into all the typical amine reactions. They can be condensed with aldehydes, ketones and oxides. Amylamine soaps can be used in dye baths to assist wetting out, dispersion and penetration.

We shall be glad to give you detailed information on Sharples Amylamines as applied to the specific problem in which you are interested.

*Pentasol (Pure Amyl Alcohol)
*Pent-Acetate (100% Amyl)
Normal Butyl Carbinol
Isobutyl Carbinol
Sec-Butyl Carbinol
Methyl Propyl Carbinol
Diethyl Carbinol
Dimethyl Ethyl Carbinol
Tertiary Amyl Alcohol
*Pentaphen
(p-Tertiary Amyl Phenol)
Diamyl Phenol
Ortho Amyl Phenol
Monoamylamine
Diamylamine
Triamylamine
n-Monobutylamine
n-Dibutylamine
n-Tributylamine
Monoamyl Naphthalene
Diamyl Naphthalene
Polyamyl Naphthalenes
Mixed Amyl Naphthalenes
Normal Amyl Chloride
Normal Butyl Chloride
Mixed Amyl Chlorides
Dichloropentanes
Amyl Mercaptan
Diamyl Sulphide
*Pentalarm
Amylenes
Diamylene
Amyl Benzenes
Diamyl Ether
SEMI-COMMERCIAL PRODUCTS
LABORATORY PRODUCTS
*Trade Mark Registered

SHARPLES TRADE MARK SOLVENTS

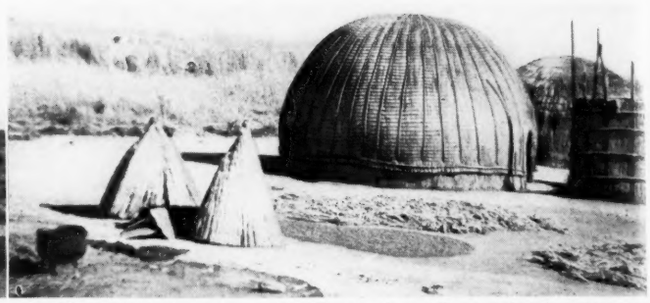
Send for your copy of the 64-page Booklet describing these Sharples Organic Chemicals.

SHARPLES SOLVENTS

THE SHARPLES SOLVENTS CORP., 23rd and Westmoreland Streets, Philadelphia, Pennsylvania

A Chemical Tourist Visits South Africa

The smelter of the Union Miniere du Haut Katanga at Lumbumbashi (Elizabethville), Belgian Congo, handles sulfite ore with a cobalt slag in five electric furnaces producing cobalt copper alloy.



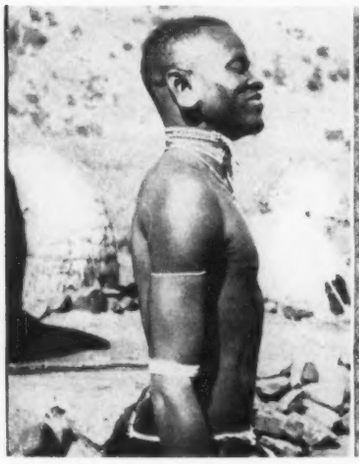
In these native grass-woven Kraals from Swayzeland, miners for the gold districts of the Transvaal are recruited. Native chiefs furnish the men under wages and labor conditions carefully controlled by the Government.

The Chitura Chemical Plant, Jadotville, Belgian Congo, which produces fatty acids, contact sulfuric acid, caustic soda, chlorine, hydrochloric acid, sodium chlorate.

The shops of Union Miniere du Haut Katanga, Jadotville, Belgian Congo, which service both mining and refining operations.

Copper leaching plant (electrolytic recovery in background), showing the Chitura Chemical Plant at the extreme left. The herring-bone-like structure is a Dorr counter current washing system.

The North Side Kambovi Mine, Kambovi, Belgian Congo. From this open cut operation the Union Miniere du Haut Katanga has taken out more than 1,000,000 tons of copper.

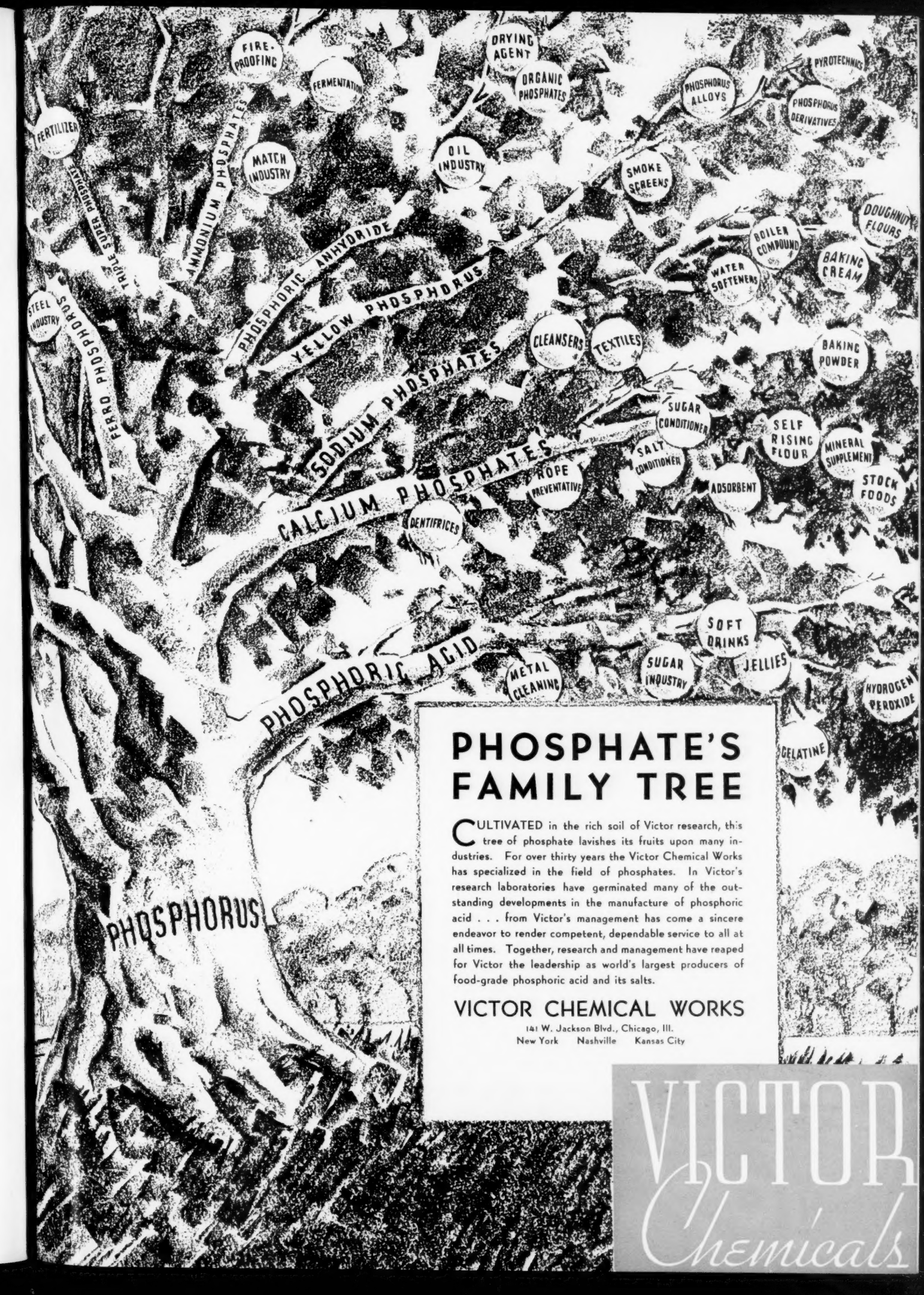


Typical of recruits' material for gold mines

Zulu belles

Zulu chief in dancing costume

Photographs by chemical engineer-candid camera-man, Walter S. Landis, vice-president, American Cyanamid Company.



PHOSPHATE'S FAMILY TREE

CULTIVATED in the rich soil of Victor research, this tree of phosphate lavishes its fruits upon many industries. For over thirty years the Victor Chemical Works has specialized in the field of phosphates. In Victor's research laboratories have germinated many of the outstanding developments in the manufacture of phosphoric acid . . . from Victor's management has come a sincere endeavor to render competent, dependable service to all at all times. Together, research and management have reaped for Victor the leadership as world's largest producers of food-grade phosphoric acid and its salts.

VICTOR CHEMICAL WORKS

141 W. Jackson Blvd., Chicago, Ill.
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VICTOR *Chemicals*

In All Humankind There Is Only One Small Carload of Iodine—about ten to twenty tons. Only about ten pounds are required every hour by the billion and a half members of the human race to help regulate body mechanism. Yet this element is of life-and-death importance.

Mallinckrodt

IODIDES . . .

Today, the Iodides are highly esteemed by the medical profession, and extensively used in industry. Mallinckrodt has given special consideration to the perfection of iodide mixtures suitable for feeding to animal and fowl, as typified by Mallinckrodt IOFLOW* and IOMAG*.

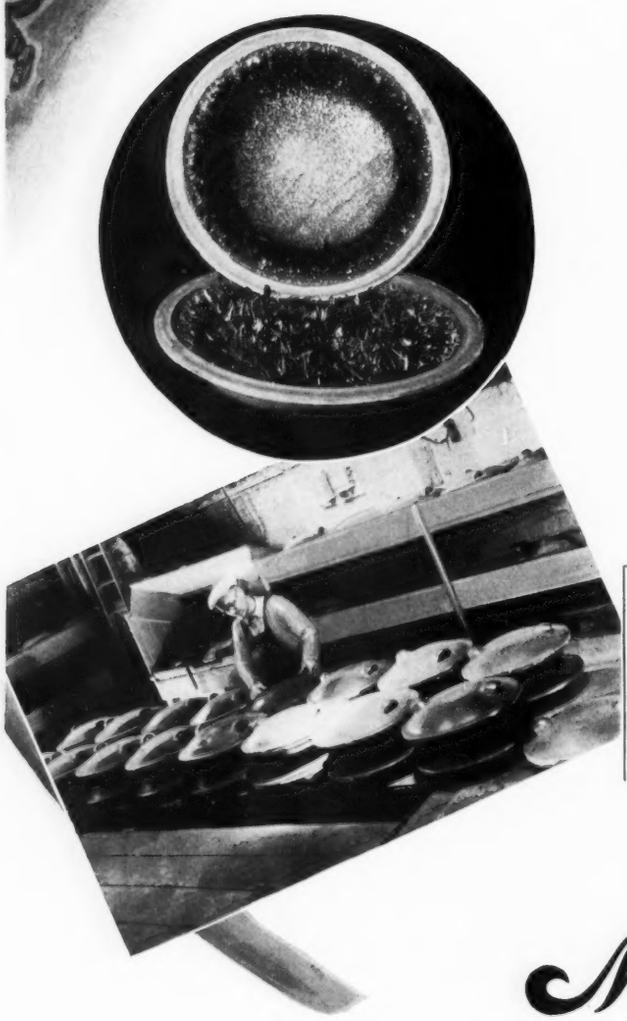
The same high standards of purity prevail as in Mallinckrodt Iodides, so widely employed in medicine, photography and many industries—

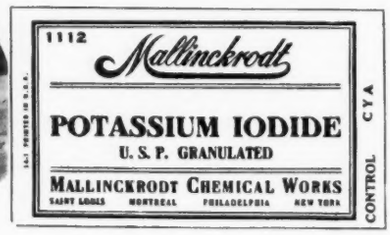
Iodine Tincture, Iodine, Ammonium Iodide, Cadmium Iodide, Thymol Iodide, Strontium Iodide, Sodium Iodide, Potassium Iodide and Mercury Iodide.

*Trade Mark

Pharmaceutical Manufacturers — Write for booklet on Iodide Therapy.

Request the Mallinckrodt Industrial-Pharmaceutical Price-List.





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CONGRESS TO INVESTIGATE TVA

President Denounces Dr. Arthur E. Morgan, Accusing Him of Contumacy—Places Dr. Harcourt Morgan in Temporary Charge of TVA—Chemical Industry Awaits Presidential Message on Phosphates—

The TVA question will receive a wide open investigation. A joint resolution (S.J. Res. 277), creating a Special Joint Congressional Committee was passed by the Senate on Mar. 25 and was concurred in by the House in the following week. The committee is to be composed of 5 Senators to be appointed by the President of the Senate and 5 members of the House to be appointed by the Speaker, and is to make a full and complete investigation of the administration of the TVA Act of '33, as amended. The committee will make a thorough study of every phase of the problem.

Morgan Achieves His Objective

Former Chairman, Arthur E. Morgan, has, it would appear, obtained his objective. In two hearings called by President Roosevelt he steadfastly refused to admit that such hearings were the proper place to air the differences existing between him and his former colleagues. Dr. Morgan was under terrific pressure. The President on Mar. 18 in concluding his second fact finding inquiry into the TVA feud, accused Chairman Morgan of contumacy and warned that as the record stood he was guilty of charges of his colleagues that he had sabotaged and obstructed the agency's work. He gave the chairman until Mar. 21 to reconsider his refusal to answer questions and when Dr. Morgan again failed to accede to presidential wishes he was removed by executive order and Dr. Harcourt Morgan was made temporary chairman of the TVA. In a statement given to the press in Chicago following his removal, Dr. Arthur E. Morgan again stated his position—that he believed that only a joint committee of Congress was the proper fact-finding body to study the charges and counter-charges which have flown back and forth between him and his former colleagues.

In view of the developments in the TVA battle the proposed presidential message on phosphates is being awaited with more than passing interest. In some quarters it is stated that the message may be delayed indefinitely. Whether the message will contain definite recommendations, particularly as to the development of Western phosphate beds, or will simply be a fact-finding report on present world-wide conditions, is not definitely known. Because of the interest that has been aroused by the TVA intra-directorate row and the announcement that President Roosevelt contemplated sending a message to Congress in the near future on the subject of phosphates, the recently released report on that material by the Bureau of Mines takes on added importance. Briefly it states:

"Twice since the close of the World War, in '20 and again in '30, upward trends in shipments of phosphate rock from American mines have been turned back by adverse economic conditions from around the 4,000,000 ton level. In '37, after rapidly rising from their post-war low point of '32, shipments from American mines once more came close to this level before another economic downswing tended to reverse the trend. Shipments of phosphate rock from American mines in '37, as reported by producers to the Bureau of Mines, amounted to 3,954,239 long tons valued at $12,964,193. Exports amounted last year to 1,052,802 long tons valued at $5,818,231, and imports were 13,400 long tons valued at $115,926. The apparent quantity available for domestic consumption, accordingly, was 2,914,837 long tons, almost equalling the high record of 3,034,333 tons in '20, and topping all other years. Although the consumption figure for '37 represents marked recovery from the low point in '32, it is about what would have been expected from the diminishing rate of increased growth indicated by the annual record just prior to the slump after '30, thus failing to confirm, as yet, any acceleration in the rate of increase in domestic consumption. Moreover, some portion of the increased consumption in '37 undoubtedly reflects the free distribution of phosphatic fertilizers to farmers by Government agencies. A new factor is the successful production and shipment on a large scale of elemental phosphorus, foreshadowing, perhaps, first, freight savings that may speed up the exploitation of huge deposits in the Western States, and, second, the increased utilization of low grade phosphate rock deposits, reserves of which would probably markedly increase present conservative estimates of mineable phosphate rock reserves of the U. S. which already exceed 7,000,000,000 tons.

"Mined production, shipments (both quantity and value), imports (both quantity and value), domestic consumption, and stocks were greater in '37 than in '36. Exports, however, both in quantity and value, were less in '37 than in '36. Total shipments in '37 were 18% above '36 in quantity, but only 13.6% greater in value, the average value per ton dropping from $3.40 in '36 to $3.28 in '37. Superphosphate production was 4,429,767 short tons, 30% higher than in '36.

Florida Leads Phosphate Production

"Phosphate rock was mined in Florida, Tennessee, Idaho, and Montana, and apatite in Virginia. Florida continued to be by far the leading phosphate rock producing state. Shipments in '37 increased both in quantity and value over '36 and as usual were mostly land pebble, the average value per ton of which declined from $3.20 in '36 to $2.99 in '37. Total exports of Florida rock were less in '37, both in quantity and value, than in '36. Stocks were larger at the end of '37 than on Dec. 31, '36. Notable was a marked increase in soft rock shipments, and a decline in hard rock exports.

"Shipments of phosphate rock in Tennessee in '37 were the greatest ever recorded, both in quantity and value."

Labor Problems Again

Labor troubles again became news after several months of relative tranquility. What promised to be a 10-day hearing on United Mine Workers charges of discrimination against their members by Dow Chemical got under way on Mar. 24 at Midland, Mich., before Trial Examiner Robert H. Denham of Washington, acting for the National Labor Relations Board.

Acting in what corresponded to the capacity of attorney for the complaining union was George J. Bott of Detroit, representing the NLRB. Associated with him in a consulting capacity were two Detroit field representatives of the United Mine Workers, Louis Weiner and Oscar Wiles. Dow Chemical, with President Willard H. Dow present, was represented by Calvin A. Campbell and C. E. Price, both of the firm's legal department. Present also were James W. Driver and S. L. Starks, personnel executives. For the Midland Chemical Workers Association, made a party to the action in the complaint, were Attorneys Walter R. Brown and Alfred P. Pierson, the latter of Saginaw.

There are two main charges: 1. That "the company is engaging in certain unfair labor practices." 2. That it "encouraged, sponsored, dominated and interfered with the formation and administration" of the Midland Chemical Workers Association and has continued to dominate such organization. The company has entered a general denial.

Calcocraft to Fight Order

Edwin W. Hamilton, counsel for Calcocraft, the independent union of workers of Calco Chemical, announced on Mar. 18 that if necessary Calcocraft would take its case to the U. S. Supreme Court, should the National Labor Relations Board accept, in its entirety, the intermediary report of Trial Examiner Charles E. Persons.

Carriers Get Half a Loaf

The I.C.C. on Mar. 8 granted freight rate increases to the carriers which will bring, according to experts of the Association of American Railroads, additional revenue of $175,000,000, instead of the $469,000,000 for which the roads applied. In contrast to the estimates of the carriers' experts, I.C.C. Commissioner Eastman implied that the sum would be $270,000,000, and declared that that amount was what the railroads needed. Rises granted vary from 5 to 10%, as against the flat 15% asked for by the carriers. The 190-page decision was extremely disappointing to rail executives, but was hailed by the opposition as a victory, for it was generally conceded that permission for an increase of some sort would be given. Opponents centered their attack on the claims of the carriers that they needed a 15% increase. Following are the highlights of the new rate increases: An increase of 5% for agricultural products, except tropical fruit; animals and animal products, lumber, cottonseed oil and vegetable oils, except linseed oil; no alteration in the rates on bituminous coal, lignite, coke, iron ore; an increase of 10% in all other items, except that "heavy loading" commodities (such as steel) which received increases last fall must include their earlier increases in the 10%. New rates are to go into effect 10 days after the railroads file their new tariffs.

Carbide Southern Expansion

Carbide and Carbon Chemicals Corp. announces purchase of a tract of land for the construction of a chemical plant in Texas City. Site is located between the properties of Pan-American Refining and Southern Pacific Railroad. No date has been set for the start of construction, and all business pertaining to the project is being handled at present through the general office of the organization at 30 E. 42d st., N. Y. City.

A large variety of synthetic organic chemicals are manufactured by Carbide. These are produced by synthesis from hydrocarbon gases. Abundance of these natural resources in this section of Texas was a determining factor in the selection of Texas City.

First unit is expected to cost $4,000,000. Tract is said to comprise about 400 acres to take care of future expansion. Don Smith, vice-president, Pan-American, has been working on the negotiations for over a year.

Du Pont at World Fair

The du Pont building at the '39 World Fair, N. Y. City, will be known as "The Wonder World of Chemistry." Exhibit will cost $500,000, will show the production of synthetic musk, synthetic rubber, synthetic camphor, manufacture of rayon, etc.

Retracts Statements

Author and publisher of "America's 60 Families" last month issued a public retraction of charges of fraud against the du Pont Co. in World War contracts with the U. S. Government. As a result of this vindication the company has withdrawn a $150,000 libel suit.

COMING EVENTS

APRIL

13-15. **National Petroleum Association,** Cleveland, Ohio.

17-22. **American Chemical Society,** Dallas, Tex., Hotels Adolphus and Baker.

19. **American Petroleum Institute, Div. of Production, Pacific Coast District,** Spring meeting, Los Angeles, Calif., Biltmore Hotel.

20-22. **American Institute of Mining & Metallurgical Engineers,** Open Hearth Conference, Buffalo, N. Y.

23. **American Electro Platers Society,** Hotel Douglas, Newark, N. J., George Wagner, 1130 S. Long ave., Hillside, N. J.

24-28. **American Water Works Association,** New Orleans, Hotel Roosevelt, Harry E. Jordan, 29 W. 39th st., N. Y. City.

24-28. **Water Works Manufacturers Association,** New Orleans, Hotel Roosevelt, Exhibits, Charles H Becher, c/o R. D. Wood Co., 400 Chestnut st., Philadelphia, Pa.

27-30. **The Electrochemical Society,** Savannah, Hotel De Soto, Philip Mcg. Shuey, 115 E. Bay st., Savannah, Ga.

28-29. **American Petroleum Institute, Div. of Production, Easton District,** Pittsburgh, Pa., William Penn Hotel.

MAY

2-5. **American Drug Manufacturers Association,** White Sulphur Springs, W. Va., The Greenbrier, Carson P. Frailey, 506-507 Albee Bldg., Washington, D. C.

9-11. **American Institute of Chemical Engineers,** Spring meeting, White Sulphur Springs, W. Va., The Greenbrier, S. L. Tyler, 29 W. 39th st., N. Y. City.

9-11. **National Lime Association,** Hotel Netherland-Plaza, Cincinnati, W. V. Brumbaugh, 927 15th st., N. W., Washington, D. C.

11-13. **Natural Gasoline Association of America,** Tulsa, Okla., Hotel Tulsa.

12. **Glass Container Association of America,** usually White Sulphur Springs, W. Va., The Greenbrier, Victor L. Hall, 19 W. 44th st., N. Y. City.

14. **American Institute of Chemists,** Annual meeting, Atlantic City, N. J.

14-21. **International Petroleum Exposition,** Tulsa, Okla.

15-21. **International Congress of Chemistry,** Rome, Italy.

23-25. **American Petroleum Institute,** 8th Mid-year meeting, Wichita, Kans., Hotels Allis and Lassen, Lacey Walker, 50 W. 50th st., N. Y. City.

23-27. **American Association of Cereal Chemists,** Cincinnati, Hotel Netherland-Plaza, G. F. Garnatz, 2810 Urwiler ave., Cincinnati, Ohio.

23-26. **National Association of Purchasing Agents,** St. Louis, Hotel New Jefferson, G. A. Renard, 11 Park pl., N. Y. City.

26. **American Mining Congress,** Cincinnati, Music Hall, Julian D. Conover, 309 Munsey Bldg., Washington, D. C.

JUNE

6-8. **The National Fertilizer Association,** White Sulphur Springs, W. Va., Hotel Greenbrier, Charles J. Brand, 616 Investment Bldg., Washington, D. C.

9-11. **15th Colloid Symposium, A.C.S.,** Cambridge, Mass., M. I. T.

13-15 **National Association of Insecticide & Disinfectant Manufacturers,** Mid-year meeting, Lake Wawasee, Ind., Mrs. E. D. Sullivan, 110 E. 42d st., N. Y. City.

14. **Oil Trades Association of N. Y.,** Sports Day, Pelham Country Club, Pelham, N. Y.

20-27. **Society of Chemical Industry,** Ottawa, Toronto, Niagara Falls, N. Y., Dr. Cyril J. Watson, 686 Echo Drive, Ottawa, Canada.

22-24. **American Pulp & Paper Mills Superintendents Association,** Annual meeting, Royal York Hotel, Toronto, Canada.

27-July 1. **American Society for Testing Materials,** Atlantic City, Chalfonte-Haddon Hall, C. L. Warwick, 260 S. Broad st., Philadelphia, Pa.

27-July 2. **American Association for the Advancement of Science,** Ottawa, Canada.

27-29. **Flavoring Extract Manufacturers Association,** Atlantic City, Hotel Traymore, E. L. Brendlinger, The Dill Co., Norristown, Pa.

Herty Work to Continue

The Pulp and Paper Laboratory of the Industrial Committee of Savannah, Inc., is now the Herty Foundation Laboratory. Funds have been found to carry on the work at the Savannah laboratory. An emergency fund was raised by equipment companies under the leadership of C. Stewart Lee, Pusey & Jones, Wilmington, Del., and the state of Georgia and the Industrial Committee of Savannah have contributed additional monies so that the work can be financed through '38.

Thiokol Moves

Thiokol Corp., manufacturer of oil-proof synthetic rubber, moves general offices and laboratory to 870 N. Clinton ave., Trenton, N. J., from Yardville, N. J.

Du Pont at Pet. Exposition

An exhibit depicting contributions of the chemical manufacturing industry to the petroleum industry will be shown by du Pont at the International Petroleum Exposition at Tulsa, May 14-21.

Plans for an exhibit at the forthcoming Coal Exposition at Cincinnati have also been completed by the company. Display is designed to demonstrate significance of modern chemistry to the coal mining industry. It will occupy booths 342, 344 and 346 in the Music Hall area, in addition to the auditorium where the company's explosives department will play host at showings of the film "The Wonder World of Chemistry."

Agrol Plant at Midland?

The Midland Chamber of Commerce is laying definite plans for an Agrol plant, similar to the one in Kansas. Several Dow men are on the committee, including Dr. William J. Hale (Dow research consultant); H. D. Anderson, traffic manager; C. J. Strosacker, production manager; Boyd Carr, statistician; Dr. Ernest Grether, organic chemist, and others. Dr. Hale was one of the first advocates of the chemurgic movement. President Willard H. Dow is now a vice-president of the Farm Chemurgic Movement.

Chemurgic Movement Expanding

Fifteen Farm Chemurgic Councils have been organized during the past year and a half and are now operating in 22 states.

Saying of the Month

"Ultimately the Farm Chemurgic Movement will put man on a pay-as-you-go basis in terms of raw materials, instead of having him on his present basis of constantly drawing out of a savings bank of raw materials which nature has accumulated for him through millions of years."—A. C. S. President, Frank C. Whitmore, before the Rochester Section, Mar. 7.

Chemists Fight Licensing of Patents

A. C. S. Files Brief With House Committee on Patents Condemning H. R. 9259—Claim it Will Act as a Brake on Progress—American Leather Chemists to Meet June 14-17—Gillett, Battelle Memorial, to Deliver Howe Lecture—

The chemical profession is attacking with vigor the proposed bill (H. R. 9259) for the compulsory licensing of patents. In general the bill would amend the statutes concerning patents cutting the exclusive right to a patent to 3 years instead of the present 17 years. After 3 years anyone may file an application for a license. After publishing the application, the Commissioner of Patents calls for a hearing open to all parties interested and then renders a decision. If the decision is favorable to the applicant, the license is granted for the life of the patent, and royalties and other conditions are set.

Appeals from this decision may be made to a Board of Appeals appointed by the President, and the patentee can appeal from the Board's decision in the U. S. District Court in his residence.

"The bill should it pass, would stifle research, retard progress, throw thousands out of work, reduce Federal tax income, hinder the development of our resources and industries, and decrease the material prosperity of our citizens," says a statement by the American Chemical Society, transmitted to the House Committee on Patents by the Society's secretary, Dr. Charles L. Parsons.

"The whole bill is a brake on progress. It seriously threatens the chemical process industries now paying one-fifth of the total federal taxes. It menaces labor and if passed it will throw out of employment hundreds, and possibly thousands, of individuals now employed for their creative capacity. The mere threat of its passage is already causing serious apprehension for the future."

Opponents of the measure point out the following disadvantages: the bill would seriously retard research and progress; would encourage secret processes rather than patents; would suppress publication of new knowledge. They point out that the only monopoly the measure would destroy is the natural limited beneficent monopoly which the patent system is intended to foster and which has been potent in the country's progress and development.

Leather Chemists Pick Date

Annual convention of the American Leather Chemists' Association this year will be held at the Bedford Springs Hotel, Bedford Springs, Pa., June 14 to 17 inclusive. Council will extend invitations to manufacturers of laboratory and tanning equipment to display their wares. No charge will be made for the privilege. Those desiring to participate may make arrangements through the chairman of the business committee, B. A. Schiller, National Oil Products, Harrison, N. J.

Gillett—Howe Lecturer

Dr. H. W. Gillett, chief technical adviser, Battelle Memorial Institute, Columbus, Ohio, has been chosen to deliver the 1939 Howe Memorial Lecture of the American Institute of Mining & Metallurgical Engineers. The Howe Lecture, established in '23 in memory of Henry Marion Howe, past president of the A.I.M.E., is given each year by someone of recognized, outstanding achievement in iron and steel metallurgy or metallography. Choice is made by the Board of Directors upon recommendation of the Iron and Steel Division.

White Receives Lilly Award

Dr. Abraham White, assistant professor of physiological chemistry, Yale, has been chosen by a committee of the A. C. S. to receive the $1,000 Eli Lilly and Co. Award in Biological Chemistry for '38.

Original Pathfinder

Extolled as "a totally original pathfinder and highly creative experimentalist," sixty-nine year old Dr. Phoebus A. Levene, member of the Rockefeller Institute for Medical Research for the past 21 years, received the Nichols Medal of the N. Y. Section of the A.C.S. at a joint dinner of the Section with the Society of Chemical Industry on Mar. 11 at the Hotel Pennsylvania.

Highest Engineering Award

The John Fritz Medal, highest honor in the engineering profession, was presented to Dr. Paul Dyer Merica, vice-president of International Nickel and one of the world's leading metallurgists, on his 49th birthday, Mar. 17, at a dinner at the Metropolitan Club, N. Y. City. He shares with Marconi distinction of being the youngest to receive this award.

Temple, Schoellkopf Medalist

Dr. Sterling Temple, chemical director at Niagara Falls plant of du Pont's R. & H. division, is the Schoellkopf medalist. Award is made annually by the Western Section of the A.C.S. Eighth winner is called a "keen thinker and capable executive who solved one of the most difficult of chemical engineering problems in the production of war gas (phosgene) 20 years ago."

Personal Notes

F. A. Lidbury, president of Oldbury Electrochemical, returned from Europe last month expressing confidence that a way out of the present political muddle will be found.

F. Gladden Searle, vice-president, Continental Can, accompanied by Mrs. Searle, is on an extensive business and pleasure trip abroad, visiting the principal European cities. They return on May 12.

P. W. Carr, Mutual Chemical, recently made a trip through the south, calling on Mutual's jobbers and their customers.

Paul M. Goodwin, one of the executives of the Southern California Minerals Co. of Los Angeles, was in the East and Southeast recently.

E. L. Luaces, consulting chemical engineer of N. Y. City, delivered a lecture on Mar. 25 before the chemistry section of the New Orleans Academy of Sciences at the chemistry amphitheatre of Tulane University. Subject: "Decolorizing and Vapor Adsorbent Carbons."

Obituaries

Edward Anthony Mechling, 60, assistant general manager, Mechling Brothers Chemical Division of General Chemical, died on Mar. 5 of a heart attack. His father, the late William Harrison Mechling, was the founder of the Mechling Brothers Co. Mr. Mechling was a member of the 1900 U. S. Olympic Track Team. He was active in rotary and boy scout movements.

Frank Gifford Tallman

Frank Gifford Tallman, 78, a du Pont vice-president, died on Apr. 1. He joined the company in '05, served as director of purchases, a member of the executive committee, vice-president in charge of purchases, and a member of the finance committee. At his own request he was placed on the retired list in 1925, when he had completed 20 years of service.

Kurt Walwer

Kurt Walwer, 46, vice-president and director of Pfaltz & Bauer, died suddenly at his office in the Empire State Bldg., on Mar. 9. He is survived by his wife, two sons and his mother.

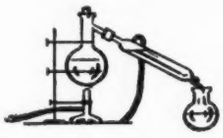
Mr. Walwer was graduated from N. Y. U. and had been with Pfaltz & Bauer for many years. He became secretary of the company in '22. In '27 he became vice-president and director of the company.

Other Deaths of the Month

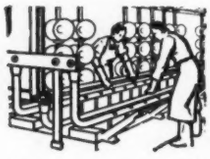
Edgar N. McVeigh, 73, vice-president, Keever Starch, on Feb. 27. . . John V. Brockway, 54, chemist with Johns-Manville, on Feb. 21. . . William T. Arnold, 36, for many years assistant to Charles Hermann of McKesson & Robbins, on Mar. 19, following two weeks illness.

CYANIDES

MADE BY DU PONT



TO the research chemist, Sodium Cyanide offers fascinating possibilities for the creation of new and unusual products. Few commercial chemicals have such a marked reactivity. Fewer yet have that combination of physical and chemical properties which has made Sodium Cyanide an important chemical for process industries which have little or no relation to each other. And the field of application is constantly increasing.



IN water, Sodium Cyanide dissolves to form an alkaline solution which is strongly reducing in character. Sulfocyanide can be made by adding finely divided sulfur to the aqueous cyanide solution. With soluble metal salts, the metal cyanides are produced; excess Sodium Cyanide gives complex cyanides. Sodium Cyanide is the starting point for the manufacture of Cyanogen Chloride, an important chemical for synthesis.

IN organic reactions, Sodium Cyanide is the basic chemical for synthesis and reactions involving the reactive nitrile (CN) group. The nitriles are valuable intermediates for the preparation of carboxylic acids, amides and amines. Typical reactions include the production of aliphatic nitriles from organic halides; cyanohydrins from the carbonyl compounds.

SODIUM CYANIDE and metal cyanides are widely used in electroplating. For heat treatment of steels, Sodium Cyanide and its mixtures are standard preparations. It has found extensive use in fumigation and extraction of gold and silver.

AS the pioneer producer and leading manufacturer of Sodium Cyanide in this country, we have many years of experience in its use and application in many industries. Let us help you in making the best use of this and other du Pont products for a particular purpose.

DU PONT
REG. U. S. PAT. OFF.

The R. & H. Chemicals Department
E. I. DU PONT DE NEMOURS & COMPANY, INC.
Wilmington, Delaware
District Sales Offices: Baltimore, Boston, Charlotte, Chicago, Cleveland, Kansas City, Newark, New York, Philadelphia, Pittsburgh, San Francisco

N. A. I. D. M. Reports Plans for Summer Meeting

New Peet-Grady Method to be Presented at Meeting at Lake Wawasee, June 13-15—National Bureau of Standards Seeks Approval of Proposed Standards on Disinfectants—Quaker Chemical Products Appoints Wittichen Chemical Southern Distributor—Lanham Bill to Revise Trademark Laws Supported at Washington Hearing—

Plans for the summer meeting of the National Association of Insecticide & Disinfectant Manufacturers at Lake Wawasee, Ind., June 13-15, call for several discussions of purchasing methods and uses for insecticides, disinfectants, and other specialties.

One of the speakers will be from the purchasing department of the state of Indiana; another is expected to be a representative of the Pullman Co. or a similar organization, who will talk on the use of insecticides, disinfectants, etc. It is understood that a completely revised new Peet-Grady Method will be presented at the summer meeting for discussion. In addition, it is also anticipated in this connection that there will be a report on the coordination of the various chemical methods of testing insecticides.

New proposed specifications of the methods of testing of several products in addition to those already adopted will be presented for the consideration of the Association.

Although most of the sessions will be confined to commercial subjects and commercial angles of technical subjects, discussions are planned that will cover all phases of industry's problems. Business sessions will be held each morning during the 3 days of the meeting. Monday and Tuesday evenings have been left open for special committee and group meetings to discuss problems that are later to be placed before the main body of the Association on the following days.

Ask Approval of Standards

The National Bureau of Standards, Division of Trade Standards, mailed on Mar. 23 copies of the proposed commercial standards on liquid hypochlorite disinfectant, pine oil disinfectant, coal tar disinfectant (emulsifying type), cresylic disinfectants, and household insecticide (liquid spray type) to a large list of producers, distributors, and users of these products, seeking approval of these standards. These standards were agreed upon at the December meeting of the National Association of Insecticide and Disinfectant Manufacturers in N. Y. City. Those interested may obtain copies from the Bureau of Standards, Washington.

Quaker Chemical Appoints

The Wittichen Chemical Co., 831 N. 19th st., Birmingham, Ala., is now representing Quaker Chemical Products Corp., Conshohocken, Pa., in the textile, leather, paper, and metal trades in the states of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, western Florida, northwestern Georgia, and western Tennessee. The Wittichen firm also acts as distributors for Solvay, Ansul Chemical, Barrett, and others. Stocks of Quaker Chemical's specialties will be carried at convenient points. James A. Brittain will be in charge of the Quaker department.

Quaker Chemical Products also reports the addition of George F. Ecker to its sales staff. Mr. Ecker was with National Oil Products for many years. In his new connection he will specialize in the sale and development of special silk oils and bases as well as rayon oils and bases. Along with this work he will be actively in charge of technical service for mills located in Pennsylvania, southern Jersey and Delaware territory.

Would Revise Trademark Law

The Lanham Bill (H.R. 9041), which would completely revise the present Federal trademark laws, received wide support at the hearings conducted in Washington last month. The bill, it is said, would bring the U. S. trademark system more closely in line with the system used in many foreign countries and would bring the U. S. procedure into conformity with the International Trademark Agreement.

Termite Control Contract

A committee of the National Pest Control Association has worked for several months drafting a model termite control contract. It is asking members of the Association to give the proposed form serious consideration.

A movement is also afoot to form a Pest Control Advertising Institute. The purpose is to engage a competent advertising agency to plan and produce advertising material for the use and benefit of the firms participating. Members of the Association are being asked to set aside from $50 to $100 from their advertising appropriations as a "guarantee fund."

Federal Trade Commission

Harry E. Adams, Peoria, Ill., trading as Electro-Thermo Wks., agrees to discontinue certain unfair representations in the sale of Thydro-X, claiming among other things that car mileage is increased 25-50%.

Vaccinol Products, Randolph Bldg., Memphis, Tenn., will stop making certain claims for Vaccinol as a treatment for termites.

News of the Specialties

Campaign for Camay

P. & G.'s latest Camay soap effort is $1,000 and 40 radios each day except Saturdays and Sundays from Mar. 28 through May 6. Contestant must write a 25-word essay on why Camay is best for the complexion.

Specialty Co. News

Ira I. Slomon, Long Island City manufacturer of adhesives and other specialties, has greatly increased its manufacturing facilities by taking over an additional building.

Haas-Miller Corp., Philadelphia, opens a district office at Charlotte, N. C. Walter G. Leon is district representative.

The Hudson Agricultural Chemical Co., S. Front st., Hudson, N. Y., is a new producer of lime-sulfur spray. Arthur W. Betts is president.

District managers and executives of the industrial cleaner division of Solventol Chemical Products, Detroit, attended a general sales conference on Mar. 9. The annual meeting of the stockholders was held the same day.

Anchor Cap and Hocking Glass have joined forces, and new company is known as Anchor Hocking Glass Corp., Lancaster, Ohio. Company now offers not only closures but bottles as well, a complete service.

Personnel Changes

J. A. Reilly becomes sale manager of Colgate-Palmolive-Peet's soap department. He was the assistant for the past two years.

A. B. Baker resigns from E. F. Houghton & Co., Philadelphia. He was connected with the Charlotte office.

Walter D. Deuble, who has been with Jacques Wolf & Co., specialty manufacturer at Passaic, N. J., for the past 25 years and has been covering New England for the past 20 years for the company, has now been made New England sales manager.

Deaths of the Month

George Hoyt Allen, 80, inventor of the formula of an oil polish which was later sold to O'Cedar Oil, on Mar. 9, at his home at Clinton, N. Y. . . . Emmett P. Murphy, 41, president, Murphy-Irwin Co., chemical manufacturer, at 4526 W. Fond du Lac ave., Minneapolis, on Mar. 6.

N. Y. State Conservation Dept. plans to attack 3 major plant pests and diseases this year—alfalfa snout beetle, the Japanese beetle, and the Dutch elm disease.

P. Q. SILICATE SERVICE for YOUR PROBLEM

* In a laundry, P.Q. service man explains how to prevent "black points". This expression refers to lime soap which accumulates at the points of collars forming black smudges. May be due to poor rinsing or lowering of pH.

"BLACK POINTS"*

HAVE you a problem which, for instance, concerns a cleaning or washing operation? Perhaps its solution hinges on a silicate of soda. Consult P.Q. Silicate Headquarters freely.

P.Q. experience in silicate detergency began 'way back in the sixties. From P.Q.'s years of concentrated effort and study on a single product, you are sure to find the right silicate, plus a helpful advisory service.

Our Technical Dept. will cooperate in the research you may undertake to use P.Q. Silicate in your plant. Tap the P.Q. reservoir of information on silicate of soda and its many uses.

33 BRANDS
meet your need for:

Adhesive	Coating
Colloid	Cement
Detergent	Size
Binder	Inhibitor
Emulsifier	Gel

Agents for forming floc and for deflocculation.

EST. 1831

PHILADELPHIA QUARTZ CO.

General Offices and Laboratory: 125 South 3rd Street, Philadelphia. Chicago Sales Office: Engineering Building, 205 West Wacker Drive.

Works: Anderson, Ind., Baltimore, Md., Chester, Pa., Buffalo, N. Y., Kansas City, Kans., Rahway, N. J., St. Louis, Mo., Utica, Ill. Stocks in 60 cities.

P. Q. SILICATES OF SODA

Industrial Chemicals in Better Demand

Seasonal Improvement Reported, But Volume is Below Normal—Tin at Low Point For 5 Years—Calcium Chloride Reduced $1 a Ton—Sodium Nitrite l.c.l. Quotations Lowered—Better Demand for Alkalies—Copper Sulfate Moving in Good Volume—Rayon Production Expands—

Industrial chemicals were in better demand in March, but the improvement was far from normal for that month. Ordinarily March tonnages vie with October for the year's best monthly volume. Spot purchasing is still highly irregular and contract withdrawals to date are disappointing.

The price structure, however, continues generally firm. Tin declined sharply last month to 38⅛c, the lowest price since early in '33, with the result that tin crystals are now quoted at 32c, sodium stannate at 26½c, and the tetrachloride at 19½c.

Rather unexpectedly one of the leading producers of calcium chloride placed a $1 reduction in effect on Apr. 1. No change was made in the quotation for liquid calcium chloride, but proportional reductions were made in the l.c.l. schedules for flake and solid. Other producers were expected to meet the new competitive conditions. The reason given for reducing prices at this time was to stimulate the use of calcium chloride over the summer months as a dust layer and to meet competition from other products used for this purpose.

A ¼c reduction was announced in the l.c.l. sodium nitrite price structure. This was done to bring the l.c.l. quotations in line with the c.l. price following the recent ¼c decline in the latter. A ¼c decrease was announced for sodium acetate in carlots and a ½c decrease in l.c.l. prices.

The higher freight rate structure which went into effect at the close of the month failed to stimulate any appreciable sudden demand. Of course many items were not affected since increases had previously been made. This situation did indicate, however, that inventories are still large in view of the current rate of consumption.

Despite the comparatively poor demand for industrial chemicals during the first quarter no price adjustments were announced for the second 3-months period on such products as are sold under contract with the quarterly price revision clause.

Steel operations expanded somewhat in March to approximately 35%. This improvement was so slight, however, that its effect was hardly appreciable on the consumption of sulfuric, or in the increase of production of copperas.

Seasonal betterment is in evidence in the alkalies. Caustic shipments to rayon plants are heavier, the same is true of soap plants. Chlorine deliveries are picking up normally both for paper production and for water treatment and sewage disposal. The call for plating chemicals, cyanides, nickel salts, chromic acid, etc., was disappointing, the expected expansion in the automotive field failing to materialize, and the outlook over the balance of the year is not overly encouraging with leaders in that field privately reporting that they do not expect over 50 to 60% of the '37 production.

Copper sulfate is one bright spot. Both domestic and export deliveries are in good volume and plants are operating close to capacity. Imported sodium silicofluoride was drastically reduced early in March, but recovered somewhat towards the close. A better demand for lime was noted.

Proof of greater activity in rayon was supplied by *Rayon Organon*, which reported that weavers in February were the busiest since last October. Shipments of rayon by producers to domestic mills gained during February and production of yarn just about equalled shipments. Yarn production is currently estimated in the trade to be at more than 80% of capacity. Rayon producers anticipate a steady and persistent demand for yarn which should lift production schedules close to the capacity levels by summer.

Hosiery shipments in January declined 6.9% from the December total and were 14% off from the January, '37 figure. Shipments of women's full-fashioned hosiery showed a seasonal decline of 29.0% between December and January.

Cotton consumed in February totaled 427,528 bales, as against 665,677 in February of last year, a drop of 35¾%. Cotton spindles active during February numbered 22,356,638, compared with 22,327,444 during January this year, and 24,517,706 during February of last year.

February newsprint production in North America declined 89,184 tons, or 23.7% from the production in February, '37. Despite the lower rate of production, shipments were again well behind the month's output with the result that stocks increased. The paper industry, however, is experiencing seasonal improvement. Output in January averaged 63.9% of capacity, compared with 54.5% in December. February rate reached 69%, and March approximately 73%. Paper manufacturers are now saying that their seasonal peak may come in early summer instead of in March and April.

Shoe output rose to 29,767,420 pairs in February as compared with 25,523,389 in January, and 39,577,566 in February of '37. Production for the first two months of the year is down 27.9% from the corresponding period of last year. March volume is estimated slightly larger than 30,000,000 pairs.

Heavy Chemicals

Important Price Changes

	Mar. 31	Feb. 28
ADVANCED		
Glycerine, soaplye	$0.09½	$0.08½
Saponification	.10½	.09½
DECLINED		
Calcium chloride, flake	$22.00	$23.00
Solid	20.50	21.50
Copper acetate, normal	.21	.23
Sodium acetate, c. l.	.04	.04¼
l. c. l.	.04½	.05
Sodium antimoniate	.12⅞	.13¼
Sodium nitrite, l. c. l.	.08¼	.08½
Sodium stannate	.26½	.28½
Tin crystals	.32	.34
Tin, metal	.38⅛	.42⅛
Tin tetrachloride	.19½	.21½

Company News

Diamond Alkali reports the opening of a Philadelphia office at 2525 Philadelphia Savings Fund Bldg., 12 S. 12 st., with C. F. Wolters, Jr., in charge.

General Chemical's Philadelphia office is at a new location, 1100 Line st., Camden, N. J. For the convenience of Philadelphia customers direct trunk lines will be maintained.

Acquires Helium

Ohio Chemical & Manufacturing, Cleveland, is said to have been the first buyer of helium from the Bureau of Mines plant at Amarillo, Tex., under the terms of the new helium control law. Sale of helium to Germany has been held up by Secretary of the Interior, Harold L. Ickes, pending the arrival back in Washington of the President from his vacation at Warm Springs, Ga. The unsettled state of European affairs is said to be the reason for the Ickes action.

Rodgers Dies

Frederick G. Rodgers, 55, president of the Rodgers Chemical Co., Pittsburgh distributor, died on Mar. 13. The business will be continued.

Preserving Wood Supplies

President Roosevelt sent a special message to Congress last month on the subject of forest lands, recommending immediate creation of a joint committee of Congress to study the matter and looking forward to legislation in '39 to promote conservation. In his message Mr. Roosevelt stressed the importance of wood as a chemical raw material and the necessity of insuring ample supplies for the future.

Booklet on Tungsten

Tungsten is the subject of the leading article in the March issue of *Priorities*, the house organ of the Prior Chemical Corp., N. Y. City.

EIGHTY-NINE YEARS OF EXPERIENCE

PFIZER QUALITY

Calomel

Mercury Oxide

Corrosive Sublimate

Ammoniated Mercury

CHAS. PFIZER & CO., INC.

Manufacturing Chemists

81 MAIDEN LANE, NEW YORK

444 W. GRAND AVE., CHICAGO, ILL.

Fine Chemicals

Tartars Advanced on Strength in Argols

March Volume in Fine Chemicals Disappointing—Quicksilver Again Reduced—Mercurials Quoted Lower—Alcohol Reduced 2c—Glycerine Firmer as Stocks Decline—Acetanilide Advanced to 32c—Bismuth Salts and Iodides Competitive—

While the volume of business transacted in fine chemicals, pharmaceuticals, aromatic chemicals, and essential oils in the first two weeks of March was about equal to the total in February, the past month could hardly be classed other than a poor one from a tonnage viewpoint. Demand slumped in the final fortnight, with only an occasional flare-up of interest. The call for most items was highly irregular. It is seldom that fine chemical makers complain of volume, but the past few months have been exceptionally dull. The mild winter, the absence of epidemics, and the generally poor state of business have all contributed to keep sales down below normal. Consumers have been drawing heavily on existing stocks.

Quicksilver continues to slide down hill at a very rapid pace, the net price loss in March amounting to $4.50 per flask. It was quoted at $72.00 per flask as the month closed, and rumors had it that even better than $70.00 was done during the month on fair sized quantities. Ample supplies of imported material have been competing with domestically produced metal for whatever restricted business opened up. The market has a distinctly bearish tone. Naturally the mercurials reacted, and corrosive sublimate was quoted at 91c, and calomel at $1.18. Other mercurials were also lower.

The generally expected advance in tartaric acid was finally put into effect, an increase of 1c per lb. A slight flurry was reported in the item as consumers took on moderate stocks. Advances were also made in cream of tartar, Rochelle salt, and Seidlitz mixture. Strength in the price of argols has been commented on several times in the past few months, and the current increases in tartars did not come as any great surprise to the trade.

Consumers of alcohol will pay 2c a gal. less for their requirements in the second quarter. Codliver oil is slightly weaker, with demand at the moment at least well below normal. Santonin was reduced twice last month, and was currently quoted at $21 at the month's close. A very quiet market prevails for menthol. Stocks in this country are heavy.

A firmer position is reported for the crude grades of glycerine and price increases were announced for soaplye and saponification grades. No change was made in the existing quotation for refined, but a firmer tone was in evidence. Most of the strychnine salts were reduced sharply early in March, including both the crystal and powdered grades of the sulfate, the nitrate, acetate, phosphate, and the crystal, granular, and powdered grades of the alkaloid. Moderate lots of sodium benzoate are said to be moving out. Prices are steady and manufacturers look for still better volume over the next two months, on the premise that stocks in consumers' hands have declined sharply. The competitive situation in bismuth salts and in the iodides remains unchanged.

A slightly improved demand for citric has occurred in line with the usual seasonal expansion at this time of the year. Prices appear to be firm. Podophyllin is still scarce and a 20c rise was placed in effect in the middle of the month, the new price being $5 per lb. Other increases included a 2c advance in acetanilide to a basis of 32c for crystal material in 2,000 lb. lots packed in barrels, and a 25c advance in theobromine. Agar is decidedly weak.

The market for aromatic chemicals was quiet during the period under review. Some shading was reported in linalyl acetate, citral was reduced 10c to a basis of $1.65 per lb., alpha-amyl cinnamic aldehyde was quoted lower at $1.85, and benzophenone was reduced to $1. Light inquiry was reported for benzaldehyde and amyl salicylate.

Increases Laboratory Facilities

N. Y. Q. (N. Y. Quinine & Chemical) has recently completed additions to its laboratory that nearly double the old facilities at the Brooklyn plant. Dr. Edward Dowzard and Dr. Joseph Schultz are in charge.

Williams Heads Committee

"Vic" Williams, Monsanto, heads the general entertainment committee for this year's meeting of the American Drug Manufacturers' Association at the Greenbrier, White Sulphur Springs, W. Va., May 2 to 5. Others assisting are: banquet, M. N. DeNoyelles, Pfizer, and Frank McDonough, N. Y. Q.; evening entertainment, Bill Barry, Mallinckrodt, and Jack Remensyder, Heyden; ladies' entertainment, A. A. Wasserscheid, Mallinckrodt, George Simon, Heyden, and James T. Pardee, Dow Chemical; publicity, Gerald S. Furman, Merck; tennis, S. Barksdale Penick, Jr., S. B. Penick & Co., and Gerald S. Furman, Merck; transportation, Bob Magnus, Magnus, Mabee & Reynard.

Tribble With M. M. & R.

Talmadge B. Tribble, formerly with Sharp & Dohme, is now Chicago manager for Magnus, Mabee & Reynard, N. Y. City essential oil house. Chicago headquarters are at 444 W. Grand ave.

Important Price Changes

ADVANCED

	Mar. 31	Feb. 28
Acetanilide, crystals	$0.32	$0.30
Acid tartaric	.25¼	.24¼
Cream of tartar	.21¼	.19¾
Rochelle salt	.16½	.15
Seidlitz mixture	.14¼	.13½
Theobromine	2.20	1.95

DECLINED

Alpha-amyl cinnamic aldehyde	$1.85	$2.00
Benzophenone	1.00	1.40
Calomel	1.18	1.27
Citral	1.65	1.75
Codliver oil	26.00	27.00
Corrosive sublimate	.91	1.00
Mercury	72.00	76.50
Santonin	21.00	25.00
Silver nitrate	.31½	.32⅝

Colloid Appoints Distributor

Colloid Chemical Laboratories appoints Schofield-Donald Co., 154 Nassau st., N. Y. City, as sole distributor of its products (complete line of fatty acid esters) to the pharmaceutical and cosmetic industries.

Guenther Shows Films

On Thursday evening, Mar. 24, Fritzsche Brothers, N. Y., presented its first public showing of Dr. Ernest Guenther's colored motion pictures filmed during his recent survey of essential oil and spice production in Africa. More than 150 customers and guests attended the presentation which was held at the N. Y. Athletic Club.

Dr. Guenther, who is in charge of the Company's research division and the author of many treatises on essential oils, prefaced his discussion of African oils with an explanation of the purposes of his annual trips abroad. He stated that Fritzsche had inaugurated a long range program some 12 years ago for a most searching investigation of the production of essential oils and raw materials in various parts of the world. As these investigations proceeded, his sponsor became more and more convinced that the only way it could provide customers with essential oils of unassailable quality was to supervise production at the source or operate their own extraction plant. Latter course was adopted with the establishment of their factory in Seillans, France.

Having covered practically all of the production centers of Europe, Dr. Guenther's investigations last year were directed toward Africa.

The Midland Chemical Workers Association (Dow Union) is toying with the idea of a union-sponsored co-operative grocery store.

Coal-tar Chemicals

Refined Naphthalene Reduced ½¢

Crude Naphthalene Stocks in Better Supply in Contrast With Situation a Year Ago—Benzol Scarce in Certain Sections—Poor Demand for Xylol, Toluol, and Solvent Naphtha—Phenol Shipments Disappointing—Little Interest in Intermediates and Coal-tar Acids—Coking Operations Curtailed—

Important Price Changes

ADVANCED

	Mar. 31	Feb. 28
Naphthalene, crude, imp.	$2.25	$2.20

DECLINED

Acid cresylic, imp., pale 97-99%	$0.85	$0.90
Naphthalene, flake, balls:		
Bbls.	.06¾	.07¼
Cases	.07	.07½

Personnel Changes

Leonard S. Little, former U. S. Finishing head, is now treasurer of Amalgamated Dyestuff & Chemical. He will have charge of research and production at company's plant at Plum Point, N. J.

As foreshadowed by recent announcements, J. Pfister, who recently was elected president of Amalgamated, has also been elected president, treasurer, and director of John Campbell & Co., 75 Hudson st., N. Y. City. Campbell organization has acted as selling agent for Amalgamated for years. Leonard G. Tubbs, formerly with National Dyeing & Printing, is a director and secretary of Campbell. George C. Lommel continues as divisional sales manager.

New Phenol Plant

General Plastics, North Tonawanda, N. Y., will erect a $500,000 unit to produce synthetic phenol. Plant will be ready in October. Process to be used is a German one and licensing arrangements have been made. Synthetic phenol is produced by fusing dry sodium benzene sulfonate with caustic potash. Product is then cooled, dissolved in water and acidified with carbonic acid.

Rosentwist Dies

Birger G. A. Rosentwist, member of the Boston dye firm of Rosentwist and Gorner, died recently in Sweden. He was for a number of years the Swedish vice-consul in Boston and was knighted by King Oscar II in '07. He came to Boston in 1891 and played an important part in the Swedish-American societies in New England.

Calco Acquires Two Companies

As we go to press, we learn that American Cyanamid's subsidiary, Calco Chemical, has acquired Amalgamated Dyestuff and Chemical, and John Campbell & Co.

Synthetic Resin Consultant

Dr. Arthur J. Norton, formerly chemical director for General Plastics, is now a consultant on synthetic resins and molding compounds, with offices at 106 Commercial st., Portland, Me.

Suppliers of coal-tar chemicals were not very much encouraged by the demand during the past month. While some seasonal expansion was reported in certain lines, the general outlook was a rather pessimistic one.

The principal price change was a ½c reduction in refined naphthalene (balls and flake). This reduction comes just as the active selling season is getting under way and is in direct contrast with the firm state of prices which existed a year ago at this time. Two reasons are contributing to the present weakness; first, the greatly increased volume of crude naphthalene available, both domestic and imported; second, the generally poor state of business.

In contrast to the acute shortage of naphthalene developing in '36, German supplies since early '37 have become steadily more plentiful. With the withdrawal of naphthalene demand for carbon black manufacture, contemporaneously with the coming into production of new productive capacity, the shortage of naphthalene became converted into an almost superabundant supply during '37, resulting in a marked revival of exports accompanied by a downward trend of average export value. At the same time American productive capacity has been increased. Where production was only 37.9 million lbs. in '34, it is unofficially estimated that '37 output was about 100 million lbs. Another factor has been the temporary decline in the consumption of naphthalene for the production of phthalic anhydride.

The low rate of activity in coking operations has prevented any unwieldy accumulations of coal-tar chemicals. Benzol stocks are still somewhat scarce in certain parts of the country. Consumption has been fairly heavy, and of course, production has declined sharply. The curtailed shipments of xylol, toluol, and solvent naphtha reflect the lack of improvement in lacquer demand by the automotive producers.

Demand for intermediates and coal-tar acids has failed so far to show definite signs of betterment. Dye makers are operating at greatly reduced manufacturing schedules pending unmistakable indications that increased demand from the textile, leather, paper, and other consuming fields is a certainty.

Importers of cresylic announced a 5c decline in the pale 97-99% grade, the new quotation being 85c. Domestic producers of cresylic have maintained prices despite the reduction in imported. A slightly better call for material was reported, particularly from the disinfectant manufacturers.

The lack of interest in phenol reflects the sharp curtailment in production of synthetic resins and molding powders since November last. Some of the slack in domestic phenol shipments has been taken up by a sudden spurt in exports.

Byproduct Coke Production off 9.7%

Activity in the coke industry in February was substantially at the same level as in January, although the trend of production was still downward. Total output from byproduct plants totaled 2,493,586 tons, a decline of 9.7% from the 2,762,474 produced in January. February '37 output totaled 3,991,481 tons. Benzol production amounted to 5,575,000 gals., a decline of 9.4% from the 6,155,000 gals. produced in January. In the first two months of '38 benzol output has amounted to 11,730,000 gals., as compared with 19,891,000 in the first two months of '37. February ammonium sulfate production was reported at 65,918,000 lbs., a drop of 12% from the 74,894,000 lbs. produced in January. For additional statistics see the Statistical & Technical Data Section (Blue Section) this issue.

There is a distinct feeling in the coaltar chemical field that if a sudden spurt in business should occur, shortages in many items would take place almost immediately. For this reason there is more than passing interest in the possibilities in steel over the next quarter. The general consensus is that ingot production will average about 42% of capacity.

Raritan River Pollution

The N. J. State Board of Health has ordered Calco Chemical, Bound Brook, N. J., to cease polluting the Raritan River by July 1. "The Calco company has shown a sincere desire to cooperate," reports Russell Watson, special assistant attorney general, assigned to Raritan pollution cases.

The Board members realize the problem is a most "unusual one to solve," and have voted that if satisfactory progress in correcting the condition was reported by the company, possible court action to enforce the order would be held in abeyance.

New Solvent Data

The Neville Co., Neville Island Post Office, Pittsburgh, has just issued the '38 edition of the valuable booklet, "Neville Coal-Tar Solvents." Complete specifications of all Neville solvents are given.

Alcohol Reduced 2¢ for 2nd Quarter

Anti-freeze Season Generally Disappointing—Petroleum Solvents Reduced 1c in Mid-Continent Area—Quotations on Butane, Heptanes, Hexanes Revised—Shipments Increase in Final Week as Freight Rate Increases Near—Major Walker Succeeds the Late William D. Ticknor as President of Commercial Solvents—

A sweeping 2c reduction in alcohol was placed in effect in the middle of the past month and applies to business to June 30. The decline affected completely denatured, specially denatured, and pure ethyl. The tankcar quotation on completely denatured is now 27c; on specially denatured No. 1, 25c; on specially denatured 23-G, 29½c; on special solvent, 26c; and on pure ethyl, $4.04. Corresponding reductions were made in the carlot and l.c.l. quotations in drums. It is no secret that the recent anti-freeze season was a distinct disappointment to most producers and stocks have been accumulating rapidly. Not only was the weather unfavorable to consumption, but the competition from methanol has become decidedly more severe. Those alcohol companies which have adopted modern merchandising programs fared the best. Alcohol consumption for industrial purposes has held up fairly well, but even here the volume is well below the figures for the corresponding period of last year.

The 1c reduction in petroleum solvents in the Chicago area (reported in last month's issue) spread to the mid-continent area early in March. This was the first general break in the market in that section for several months, and was generally the result of continued poor demand from the mid-western industrial centers. The price cutting did not generally spread to the East Coast, at least to the extent of open price reductions, but the market there was none too steady. Reductions in tankwagon quotations on v. m. & p. naphthas in the Boston area were reported. In some quarters it was said that 11½c was being done against a posted price of 13c per gal.

Certain price revisions have been made in the light gaseous solvents group. Industrial grade of butane is now quoted at 3¾c in tanks in group 3, as against a former schedule of 2½c-3¾c, depending upon the number of cars used per month. The 77-115° heptanes in drums in carlots are now 11c, as compared with 12c; the tankcar quotation is unchanged at 8½c; the 86-100° in tanks is 9½c, as compared with 10½c; drums, 11½c, as compared with 13c. The tankcar price for hexane was continued at 10½c, but the drum quotation was reduced ½c to a basis of 12½c. The tankcar price of octanes was unaltered at 10½c, but the drum price was also reduced ½c to a 12½c level.

A decided improvement in the demand for petroleum solvents took place in the final week of the month, much of it attributed to the desire on the part of consumers to "beat" the freight rate increase. The betterment was sufficient to lend strong support to the mid-continent market and to strengthen the eastern price structure sufficiently to stop talk that prices in that section would soon follow the decline in the mid-continent area. In fact there was some feeling in the latter field that the 1c decline had been too drastic and part or all of it should be recovered. This bullish tendency was somewhat tempered by the rather bearish tone of the crude markets. The feeling is somewhat general, however, that crude prices will hold until the heavier spring demand occurs. The bearish tone to the market for paraffin waxes is worse instead of better, and 2c per lb. is said to be the market for either 122-124 or 124-126 American. The fully refined wax market was unchanged.

Only a fair market was reported for acetone, ethyl acetate, butyl alcohol, butyl acetate, and the more important plasticizers. Competition in acetone and butyl alcohol is still very much in evidence, but no price changes were announced.

Ethyl alcohol production in February totaled 16,708,492 proof gals., as compared with 15,847,102 in January, and 17,571,564 in February of '37. Production of completely denatured totaled 153,361 wine gals., in February, 168,465 in January, and 486,698 in February of last year. Volume removed in February totaled 151,155, in January 178,156, and in February of '37 removed amounted to 424,528 wine gals. Stocks on hand on Feb. 28, '38, totaled 540,245 gals., as compared with 767,112 at the end of February a year ago.

February production of specially denatured amounted to 4,934,113 wine gals., as against 5,714,329 in January, and 4,987,938 in February of '37. Removed in February totaled 4,845,397, as compared with 5,761,436 in January, and 4,986,079 wine gals. in February of last year. Stocks of specially denatured totaled 638,597 wine gals. on Feb. 28, '38, as against 501,387 on the same date a year previous.

February production of synthetic methanol showed a decided gain over the same month a year ago, the respective figures being 2,290,609 gals. and 1,849,302 gals. Production of crude in February totaled 404,970 gals., a slight decline from the 500,685 gals. reported in February of '37.

Solvents & Plasticizers

Important Price Changes

	Mar. 31	Feb. 28
ADVANCED		
Butane, tks., group	$3.03¾	$0.02½
DECLINED		
Alcohol:		
C.D., tks.	$0.27	$0.29
Drs.	.33	.35
S.D. 1, tks.	.25	.27
Drs.	.31	.33
Special solvent, tks.	.26	.28
Methyl acetone, tks.	.26½	.28½
Drs.	.31½	.33½
Petroleum Chemicals:		
Cleaners Naphthas, tks., group 3	.06⅜	.07⅜
Lacquer diluents, group 3	.07⅜	.08⅜
Naphtha, V.M.P., group 3	.06⅜	.07⅜
Petroleum thinner, group 3	.05⅜	.06⅜
Rubber solvent, group 3	.06⅜	.07⅜
Stoddard solvent, group 3	.05⅞	.06⅞

Ticknor, Solvents, Dies

William Davis Ticknor, 57, president and chairman of the board of Commercial Solvents, died on Mar. 24, of a heart ailment, in his home in Englewood, N. J. He was born in Boston, came to N. Y. 25 years ago and engaged in the banking field. He became president of Commercial Solvents in '22.

Mr. Ticknor was a director of several corporations, including Corn Products Refining, B. F. Goodrich Co. and American Machine and Metals. He was a member of the Metropolitan Club, Racquet and Tennis and Brookline Country Clubs.

Surviving are his wife, Mrs. Ella Frances Wattles Ticknor; two sons, Benjamin Holt Ticknor, 2d, who was All-America center and captain of the '30 Harvard University football team, and William Davis Ticknor, Jr., who also played football at Harvard; a brother, Benjamin Holt Ticknor, and two sisters, Miss Edith Ticknor, and Mrs. James M. Hunnewell.

Major Theodore P. Walker, formerly executive vice-president of Commercial Solvents, is the new president, succeeding the late William D. Ticknor. The new president joined the company in 1922, three years after its founding. In '24 Major Walker was elected a vice-president, and in '28 was elected executive vice-president. He became a director in '33.

Other officers of the company: E. L. Pangborn, vice-president; H. W. Denny, vice-president; T. F. Carty, treasurer; A. R. Bergen, secretary; A. H. Braun, controller; W. A. Burton, vice-president (London office); C. L. Gabriel, vice-president; H. E. Perry, vice-president; R. Bocqueraz, vice-president.

Agricultural Chemicals

Greater Activity by Fertilizer Mixers Reported

Organic Ammoniates Weak—Price Cutting Prevalent in South Atlantic States—Tax Tag Sales Holding Up Well—A 6,900,000 Ton Year Expected—Superphosphate Production Drops Sharply—Turrentine Honored—Zinc Arsenate, Zinc Arsenite Reduced ½c—Agricultural Insecticide Season Opens Up—

Important Price Changes

	Mar. 31	Feb. 28
ADVANCED		
Dicalcium phosphate, imp.	$0.79	$0.78
Nitrogenous mat.:		
East	2.75	2.65
West	2.35	2.20
DECLINED		
Blood, dried, N. Y.	$2.85	$3.00
Chgo., high-grade	3.00	3.10
Imported	3.15	3.25
Jap. sardine meal, ship.	45.00	46.00
Nitrogenous mat., imp.	2.50	2.60
Tankage, grd., N. Y.	2.80	3.00
Unground	2.70	2.80
Fert., grd., Chgo.	2.55	2.60
Imported	3.00	3.20
Zinc arsenate	.12½	.13
Arsenite	.12½	.13

Superphosphate Declines

February superphosphate production declined somewhat more than seasonally from January to February and was 22% under production of February of '37, with output showing a much larger drop in the Southern area than in the North. Production in the first 8 months of the current fiscal year, from July through February, was 6% larger than in the corresponding period of last year. The increase over last year has been getting progressively smaller, and it is likely to disappear altogether by June. Total stocks at the close of February were 13% greater than a year earlier and were slightly larger than at the end of January. See Statistical & Technical Data Section.

France Honors Turrentine

Dr. J. W. Turrentine, president, American Potash Institute, Washington, has been awarded the Gold Medal of the Academie d'Agriculture de France for the collaboration of the Institute in the preparation of the book, "Potash Deficiency Symptoms."

Good Insecticide Demand

Gradual improvement is reported in the markets for agricultural insecticides and fungicides as the active shipping season gets under way. A satisfactory amount of interest has been shown so far in calcium and lead arsenates. Shipments of lime-sulfur have to date been very encouraging. Demand for copper sulfate is exceptionally heavy and producers in some instances are having some difficulty in making prompt shipments. A firm tone is reported in nicotine sulfate. The only price changes in this group were ½c reductions in zinc arsenate and zinc arsenite. The lower level for the metal was largely responsible for these declines.

The last 10 days of March witnessed a decided opening up in the raw fertilizer markets. With an overwhelming approval of the new farm program by the farmers, the situation is somewhat clearer. Mixers are now showing a greater disposition towards getting manufacturing operations under way on a scale more normal for this period of the year. Further impetus was given to shipments to consumers where the higher freight rates are a factor. Specially heavy was the demand for nitrate of soda. Sulfate was also moving into consuming channels at a faster rate. So far there has been little heard of shortage of supplies because of the low rate of coking operations, but any sudden improvement in demand might cause some embarrassment to shippers at certain points. A slight pick-up in spot purchasing of potashes was reported, but in most instances buyers over-estimated their needs and trading in this material is expected to be light over the next few months. Most of the phosphates were quiet.

Price changes in the raw fertilizer materials were indeed few last month. Generally speaking, the organic ammoniates were weak in the face of little buying interest. Imported material was weak, partly because holders abroad sought to unload their holdings for cash in the face of the troubled political situation. Japanese sardine meal for shipment was quoted at $45, a loss of one dollar from the February quotation. Operators in Menhaden scrap started offers in futures last month, and quite a little tonnage changed hands at a figure about 50c a ton lower than the opening price last year.

The fertilizer trade is disturbed over the price structure of mixed goods. Conditions in the South Atlantic states are said to be specially competitive. Price cutting is said to be forcing some producers in the Carolinas to withdraw quotations in the hope that conditions will improve within a reasonable time.

Fertilizer sales this year, as indicated by the sale of tax tags in January and February, have held up well, particularly in view of the decline in prices of farm products, a prospective shrinkage in farm income, and uncertainty over operation of the Farm Bill. Total tag sales in February were 759,813 tons, a decline of 6% from February, '37, but a gain of 33% above February, '36. Sales in January were above the same month of the year previous, so that combined sales in the two months were within 1% of the sales in the corresponding period of last year. February sales were larger than last year in Mississippi, Tennessee, and Arkansas. A particularly sharp drop took place in South Carolina. Specially pleasing to the industry is the sharp rise in tag sales in the midwest. February sales were 58% above last year, following a 33% increase in January. Detailed figures of tag sales will be found regularly in Part 2, the Statistical & Technical Data Section.

The recently announced farm program apparently has had little influence either way on the estimates of fertilizer sales during the current season. Evidently most statisticians had discounted its effect prior to the final passage of the legislation. After two questionnaires the Potash Institute still holds to its previous estimate of 6,900,000 tons. The N.F.A. reports that approximately 1,300,000 tons are likely to be used on the '38 cotton crop, a reduction of about 400,000 tons from the '37 figure.

January exports of fertilizers and fertilizer materials totaled 121,745 short tons valued at $1,353,393, a gain of 78% in tonnage and 113% in value over January of '37. Substantial increases were shown in exports of sulfate, other nitrogenous chemicals, and rock; decreases were reported in superphosphate and potash. Imports, on the other hand, were 15% less in volume and 14% in value than in January, '37. A total of 189,174 short tons valued at $3,936,413 was reported. Imports of potash were much smaller than in the same month of last year, but increases were noted in the nitrogenous materials group. For further details consult Part 2 (Statistical & Technical Data Section).

January sulfuric acid production by fertilizer manufacturers totaled 183,794 tons, as compared with 199,508 tons in December, 176,492 tons in January of '37, and 156,878 in January of '36. Consumption amounted to 147,443 tons, compared with 189,960 in December, 164,320 in January, '37, and 125,730 tons in January of '36. Stocks rose slightly in January to 89,662 tons, as against 87,290 in December, 72,473 in January of last year, and 88,356 in January of '36. See Statistical & Technical Data Section.

Townsend Dies

Philip Townsend, 61, well-known fertilizer operator and at one time or another with Armour, Swift, and V. C., on Mar. 8, at his home in Columbia, S. C.

Fats and Oils

Chinawood Oil Prices Sink Lower

Poor Demand for Drying Oils Continues—Soapers Fail to Buy as Heavily in March as They Did in February—Refined Fish Oils Steady—Animal Oils and Fats Decline—Record Cotton Oil Disappearance in February—Record Consumption of Fats and Oils in '37—

Price movements in the oils and fats were mixed in the past 30 days. On the upward side were corn, peanut, and crude sardine. The steady advance in refined fish oils of the past 60 days was halted in March. Most of the paint oils again registered further losses. In the absence of anything like sustained demand, Chinawood went to 12c in drums and 11½c in tanks. Competing oils were weaker, babassu closing the month at 6⅝c in tanks, oiticica at 10½c in barrels. Linseed was quoted lower and considerable shading under published quotations was reported from several parts of the country.

Many of the soap oils declined in the month's trading. Buying by soapers was generally light, following the better demand that was in evidence in this direction in February. Copra was weak and the edible and inedible grades lost ground in March. Crude menhaden declined 2½c, but the refined grades were unchanged. Fatty acids were generally firm and unaltered in price. Cottonseed oil markets had a bearish tone despite the fact that use remains large. Greases sank lower in company with tallow. Oleo oil quotations were shaded.

The oils and fats price index of the Bureau of Raw Materials for American Vegetable Oils and Fats rose in February to 89.7, as compared with 88.4 in January. The Index, however, stood at 129.3 in February, '37. Advances in February over January occurred in lard, corn, oil, soybean, and cotton oils; declines were registered in grease, Chinawood, coconut, linseed, olive, olive oil foots, oleo, palm, palm kernel, peanut, oleo stearin, and tallow. Only the sharp advances in corn, soybean, and cotton oils, particularly the latter, prevented the Index from showing a loss, for the majority of the oils and fats declined in price.

Another record cotton oil disappearance was established for February with a consumption of 428,531 bbls. Total consumption for the 7 months now totals over 2,800,000 bbls., as contrasted with somewhat over 2,000,000 bbls. for the similar period in the preceding crop year. Such disappearance also is at record levels.

Consumption of fats and oils reached record proportions in '37, according to preliminary estimates by the Bureau of Agricultural Economics.

Apparent U. S. disappearance of all fats and oils, both domestic and foreign and for all purposes, indicates a consumption of more than 9.3 billion lbs. This figure for the past year's domestic use is about 136 million lbs. larger than the estimate for '36 and a little over 500 million lbs. larger than consumption in '29, which was the peak year prior to '36.

The Bureau report points out that changes with respect to individual fats and oils were as significant as the increased consumption. The 400-million-lb. increase in the year's consumption of cottonseed oil more than equalled the decreased consumption of the total of two imported oils, coconut and rape, and of lard and other domestically produced edible animal fats. An increased use of 105 million lbs. of linseed oil and 30 million lbs. of tung oil was not entirely offset by decrease of 70 million lbs. of perilla oil and practical elimination of hempseed oil.

Disappearance of palm-kernel oil in '37 was more than 100 million lbs. larger than in '36, and the decreased consumption of inedible tallow and grease amounted to about 66 million lbs. It is believed, therefore, that an increasing quantity of palm-kernel oil has gone into soap. The '37 consumption of teaseed oil increased over '36 by about 21 million lbs., more than offsetting the decreased consumption of edible olive oil and sesame oil.

If the cotton crop this year is held within the national allotment of 10,750,000 bales, it would mean a reduction of about 40 to 45% in the amount of cottonseed oil produced, compared with that from the '37 crop of 18,746,000 bales. Lard production, on the other hand, is expected to increase. Lard stocks on Feb. 1 amounted to about 97 million lbs., considerably smaller than a year earlier, but larger than the 5-year February average of 91 million lbs. for '29-'34.

Tung Oil Inspection

Dr. Henry Knight, chief of the Bureau of Chemistry and Soils, Dept. of Agriculture, will make his first trip through the tung oil area in company with C. C. Concannon, Chief of the Chemical Division, Bureau of Foreign & Domestic Commerce, this year, where they will visit typical groves and experiment stations at Gainesville, Fla., and Poplarville, Miss., where the situation will be discussed with county agents, Mississippi Commissioner of Agriculture, Holton, and other state officials and individuals throughout the south interested in tung oil. Visits will also be made to tung mills at Gainesville, Fla.; Cairo, Ga.; Picayune, Miss.; and Bogalusa, La.

Important Price Changes

	Mar. 31	Feb. 28
ADVANCED		
Corn, refd., bbls.	$0.10	$0.09¾
Neatsfoot, extra, bbls.	.09¾	.09½
Peanut, crude, tks.	.07⅜	.07¼
Refined, bbls.	.10⅛	.10
Sardine, Pac. Coast, tks.	.46½	.45½
DECLINED		
Babassu, tks.	$0.06⅝	$0.06¾
Chinawood, drs.	.12	.14½
Tks.	.11½	.13¾
Coconut, edible, bbls.	.09¼	.09½
Crude, Manila, tks.	.03⅝	.04
Copra	.02025	.0215
Linseed, raw, tks.	.091	.093
Menhaden, crude, tks.	.35	.37½
Oiticica, bbls.	.10½	.11⅞
Oleo, No. 1, bbls.	.09	.09½
No. 2, bbls.	.08½	.09
Olive oil foots	.08¾	.09
Palm niger	.04	.04⅛
Rapeseed, denat.	.88	.90
Stearine, oleo	.07¼	.07¾
Tallow, extra loose	.05⅜	.05⅞
Edible	.06¼	.07

'37 Imports of Drying Oils

U. S. imports of drying oils and drying oil seeds advanced almost 35% in '37 to a value of $57,000,000 from $42,600,000 in '36, according to *The Tung Oil Monthly*. Flaxseed headed the list with receipts aggregating 28,000,000 bu., valued at $35,000,000. In '36 total reached 15,400,000 bu., valued at $17,650,000. Domestic production of flaxseed in '37 was estimated at a little less than 7,000,000 bu., or about one-fifth of the amount crushed for oil during the period.

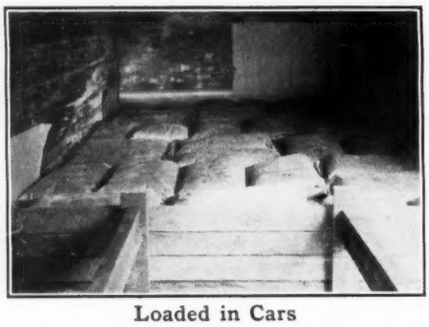
Tung oil followed with imports reaching 175,000,000 lbs., valued at $20,000,000—greatest amount ever imported in any one year—despite disturbed conditions in China. In '36 tung oil imports were 135,000,000 lbs. invoiced at $18,000,000. Imports of perilla oil declined substantially last year to 43,600,000 lbs., valued at $2,130,000, from 118,000,000 lbs., valued at $7,000,000 in '36—decrease being due to imposition of an excise tax on imports of this product during the latter part of '36. A total of 3,630,000 lbs. of oiticica oil were imported last year.

Personnel Changes

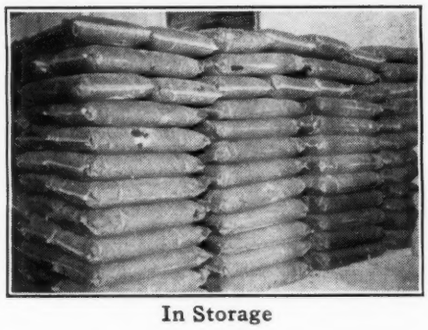
Wheeler McMillen was elected on Mar. 9 the director and vice-president of the Chemical Foundation. He succeeds the late Francis P. Garvan as director. Mr. McMillen becomes ranking officer as no immediate successor is proposed for the office of president, an office that Mr. Garvan held for 18 years. Mr. McMillen is president of the Farm Chemurgic Council, and is editor of *Country Life*.

The Alex C. Fergusson Co., Philadelphia chemical distributor, opens a branch office and warehouse at Franklin and Scott sts., Allentown, Pa.

THE ROSA COMPANY
OF HOMERVILLE, GEORGIA
HAVE INSTALLED A BAGPAKER
NOW
YOU CAN OBTAIN ALL GRADES OF GUM ROSIN IN BAGPAK PAPER BAGS



Loaded in Cars



In Storage

Here's Why The Rosa Company Switched

Before adopting Paper Bags and offering them to the trade, The Rosa Company in conjunction with Bagpak, Incorporated made innumerable tests which proved conclusively that Bagpak Bags are the perfect container for Rosin.

Bags were stored outside with no protection for over a year, both in the North and South. These filled bags withstood the intense heat of the subtropical sun, the ice and snow of the North, plus rain and sudden temperature changes, without noticeable harm to either the bags or their contents.

ROSIN MANUFACTURERS ARE INVITED TO INVESTIGATE THE ECONOMY AND OTHER ADVANTAGES OF BAGPAK BAGS AND EQUIPMENT

"One-man package... easy to handle"

BAGPAK INC

Trade Mark reg. U. S. Pat. Off.

220 EAST 42nd ST. NEW YORK CITY

Natural Raw Materials

Pyrethrum Prices Advanced Sharply

Candelilla Strong at Primary Sources—Shading in Carnauba —Shellac Prices Drop ½c—Easier Tone in Varnish Gums—Sumac Quotations Lowered—Starch, Dextrin Advanced 5c—Turpentine at 40-Year Low Point—New Naval Stores Loan Plan Released—Crosby Naval Stores Co. Starts Production—Read Appointed a Distributor—

The markets for natural raw materials failed to expand in trading volume in the past month. Purchasing in most items is still restricted to small lots mainly for replacement. With both foreign and domestic conditions very unsettled, there exists little excuse for building up inventories that already are in many cases in excess of current business requirements.

Further price advances were made in pyrethrum flowers and in the various grades of extract. In many instances, however, buyers of the flowers are simply covering part of their immediate requirements, hoping that easier prices will follow. There is much unfavorable comment on the poor quality of the new crop.

Light trading featured the wax markets. Candelilla was advanced 1c to 14½c in the face of higher replacement costs in primary centers. Keen competition has broken out among local sources of supply on Carnauba, and it is reported that published prices were being shaded on any worthwhile business that appeared. A slight decline was noted in Japan and factors were quoting 9¾c in most instances.

Shellac prices broke open in March after several months of under-cover price shading. Bone dry, Garnet, Superfine, and T.N. grades were openly slashed ½c.

An easier tone was in evidence on many of the varnish gums. Consumption to date has been well below earlier expectations. Stocks here and abroad on many items are large in view of current requirements and the immediate outlook in the varnish field. Batavia dammar gums were specially vulnerable in price, most of the weakness being blamed on declining markets in primary centers.

Quiet demand was in evidence in the 30-day period for most of the natural tanstuffs and dyestuffs. Prices were generally well maintained, however. A 50c a ton decline was reported in Myrobalans J1, a $1.50 a ton reduction in ground sumac, to a basis of $64.50, and a $3 a ton drop in leaf, to a $67 a ton basis, were the chief price rearrangements made during the month. Fustic and indigo were firm. The price structure of all the extracts remained unchanged.

On the upward side of the market a 5c increase was placed in effect late in the month on dextrin, starch, and other corn derivatives. The demand for these products has been heavy in the past two months, and it is said that users have been acquiring stocks believing that higher prices would prevail shortly.

The naval stores markets still appear to be in the doldrums. Turpentine has declined to the lowest price in over 40 years, while movement in rosins is mixed. Naval stores factors are not greatly pleased at the new loan plan, feeling that the prices set are too low. Buyers, on the other hand, are holding off from any forward buying, feeling that conditions are still so uncertain that heavy purchasing at this time is not a wise procedure to follow. A rather poor foreign demand is reported in the primary centers. The statistical position presents very little change from the February close.

Loans for Naval Stores

Loans under the new $7,000,000 Commodity Credit Corp. program for the naval stores industry will be on the basis of 26c per gal. for turpentine and $5.75 per bbl. of medium grade rosin. Loan program will be operated through the American Farmers' Association.

Herle Langdale, president, states: "Unless turpentine brings 30c to 35c and rosin $2 to $3 above its loan value, we are going to put our products in the loan." He also revealed that an advertising campaign will be undertaken to regain some of the markets lost to mineral spirits and other competitive products.

It was later disclosed in Washington that the loan program will be limited to not more than 150,000 units of gum commodities. Other conditions provide: That producers who fail to comply with the naval stores conservation program forfeit their equity in the collateral; that producers contribute 65c per barrel of turpentine and a like amount per round barrel of rosin as cash collateral; that the farmers' association submit a marketing program providing for liquidation of pledged collateral within a reasonable time limit; that loans be secured by warehouse receipts.

A. A. A. pointed out that the naval stores conservation program is effecting some reduction in production of the commodities. Inventory stocks of gum naval stores on Jan. 1, '38, were the lowest at that time in 5 years.

General Naval Stores had a $100,000 fire at Cincinnati storage yards on Mar. 19. Officials state no interruption will occur in shipments.

American Dyewood will move its executive offices from Pershing Sq. Bldg., N. Y. City, to 15 E. 40th st., May 1.

Important Price Changes

	Mar. 31	Feb. 28
ADVANCED		
Candelilla wax	$0.14½	$0.13½
Pyrethrum ext., 3.6%	9.60	8.50
2.4%	6.40	5.70
Flowers, coarse	.23¾	.22
Fine powder	.25¼	.23
Kino gum	2.50	2.00
DECLINED		
Carnauba, No. 1 yellow	$0.38	$0.39½
No. 2 yellow	.37	.38½
No. 2 N. C.	.35½	.36
No. 3 chalky	.32½	.33
No. 3 N. C.	.32½	.33
Copal Manila, loba C	.10½	.11¼
Dust	.06⅜	.06⅝
M. A. sorts	.06⅜	.06¾
Dammar Batavia A	.23¼	.25½
B	.21¾	.24
C	.18⅞	.20⅜
D	.16⅜	.17½
A/D	.18⅞	.19½
Japan wax	.09¾	.10
Myrobalans, J1	28.50	29.00
Shellac, bone dry	.16½	.17
Garnet	.13½	.14
Superfine	.11½	.12
T. N.	.11	.11½
Sumac, grd.	64.50	66.00
Leaf	67.00	70.00
Zinc dust	.06¼	.06¾

New Naval Stores Plant

The Crosby Naval Stores Co., wholly owned subsidiary of Goodyear Yellow Pine, is a newcomer in the production of steam distilled turpentine, steam distilled pine oil, and wood rosin. New plant costing $600,000 is located at Picayune, Miss. Various naval stores specialties will also be made. The Crosby family are also pushing domestic tung oil in Mississippi.

The Crosby interests have appointed Charles L. Read & Co., 120 Greenwich st., N. Y. City, as their representative for N. Y., N. J., and New England territory.

The shipping point of the Crosby plant is at Goodyear, Miss., which is on the Pearl River Valley Railroad, connecting with the Southern at Nicholson, Miss. Export shipments will be cleared through New Orleans and Gulfport.

Foreign News

The Trafford Chemical Co., newly formed with a nominal capital of £500,000, is said to be a contact between I.C.I. of England and the I.G. of Germany. Capital of the Trafford company is reported to be held jointly by the British and German combines. Arrangements are said to have been made for close cooperation on a number of matters.

Witco, Ltd., London, is now Harold Wilson and Witco, Ltd. Mr. Wilson has been internationally known in the pigment and color fields for 40 years. Chairman in the new set-up is Robert I. Wishnick; joint managing directors are Harold Wilson and Thomas F. Dunn; C. C. Hallett is sales manager.

Pigments and Fillers

Paint Operations Expand Seasonally

Manufacturers Finally Start Belated Seasonal Production—Basic Carbonate, Sulfate, Blue Lead Reduced—Casein Declines Further—Heckel Honored at Dinner—Sherwin-Williams to Make Titanium Pigments—National Lead Offers 2 New Pigments—Higher Freight Rates on Carbon Black—

Important Price Changes

	Mar. 31	Feb. 28
ADVANCED		
Carbon black, c. l., Gulf ports	$2.75	$2.70
DECLINED		
Casein, 20-30	$0.07½	$0.08½
80-100	.08½	.09½
Lead, N. Y.	4.50	4.90
Lead, white, dry	.06¼	.06¾
Basic sulfate	.05¾	.06¼
Mercury oxide, tech. red	1.17	1.26
Yellow	1.12	1.21
Putty, tubs, com.	2.25	2.40
Linseed	4.00	4.25
Red cadmium lithopone:		
Light	.75	.81
Med. light	.80	.86
Medium	.85	.91
Deep shade	.90	.96
Maroon	1.00	1.06
Vermilion, English	1.45	1.50
Yellow cadmium litho-pone	.50	.56
Zinc metal, E. St. Louis	4.25	4.75
N. Y.	4.60	5.10
Zinc oxide, Amer., 35 and 50%	.05¾	.06

"Uncle George" Feted

George B. Heckel, editor of *Drugs, Oils, and Paints,* Philadelphia, was very much in the hands of his friends Mar. 11—the occasion—the paint industry's celebration of "Uncle George's" 80th birthday and the 50th anniversary of his founding of the paper. Over 200 of the leading executives in the coatings field gathered at the Waldorf-Astoria in a grand tribute to this beloved character. E. V. Peters, St. Joseph Lead, presided, George A. Martin, president of Sherwin-Williams, was toastmaster. Included in the list of speakers were E. T. Trigg, N. P. V. & L. A. president; E. V. Ladd, president of the Federation of Paint & Varnish Production Clubs; S. C. Dunning, president of the N. Y. Paint, Varnish & Lacquer Association.

Higher Carbon Black Rate

I.C.C. approves increase of 5c per 100 lbs. on rates for carbon black, carloads, from producing points in Texas, Oklahoma, and Louisiana to Gulf ports. Increase will apply to both coastwise and export traffic. Commission rejected proposal of a 5c increase from these producing points to destinations in the U. S. and Canada. Proposals were filed in March of '37.

Offers New Pigments

National Lead is reported offering two new pure basic carbonate of lead pigments, designated as No. 333 white lead and No. 111 white lead. Details are available from the company headquarters in N. Y. City.

After remaining in the doldrums for the better part of March the raw paint materials suddenly came to life in the final week of the month. Some of this improvement was undoubtedly due to the approach of higher freight rates on many items, yet suppliers also reported that consumers who take deliveries by truck were also coming into the market in greatly improved volume. There are signs that the belated seasonal improvement in paint production and consumption is now on the way. Even if a spurt does follow, it is not likely that the spring of '38 will easily be forgotten by factors in the raw materials used in paint, varnish and lacquer manufacture.

Price changes were practically all on the downward side, with the exception of an increase in standard grades of carbon black placed in effect on Apr. 4 and caused by higher freight rates. It was a foregone conclusion that the rate increase would be passed on to consumers by the carbon black producers in view of the low prices prevailing for that item.

Prices for dry basic carbonate, sulfate and blue lead in barrels were lowered ½c on Mar. 10. Prices for smaller containers were reduced ¼c, while lead-in-oil was lowered ½c. The new prices for basic sulfate and blue lead, in barrels, are: carlots, delivered Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, 6c, with carlots delivered elsewhere, 5¾c. L. c. l. prices are ¼c additional. Schedule for basic carbonate in barrels is ½c higher than the prices for basic sulfate. Lead-in-oil prices were reduced ½c to 11¼c to consumers; 10¼c to painters; and 9¼c to dealers. Keg prices for dry red lead and prices for lead-in-oil were reduced ¼c, but there has been no change in the price for dry red lead in barrels since Feb. 10.

The decided weakness in lead was also responsible for a ¼c reduction in both 35% and 50% leaded oxides to a basis of 5¾c in bags in carlots, with barrel packing a ¼c additional.

The severe decline in quicksilver was reflected in an additional reduction in English vermilion, now at $1.45 per lb., and declines in technical red mercury oxide from $1.26 to $1.17, and in yellow mercury oxide from $1.21 to $1.12, in both cases a loss of 9c a lb.

Weakness in casein continues unabated and several reductions were made in the past month, the closing prices being 7½c for 20-30 mesh, and 8½c for 80-100 material. Demand is exceptionally poor and stocks have been accumulating rapidly.

Red and yellow cadmium lithopones were reduced 6c on Mar. 15. New prices for reds in 400-lb. barrels are as follows: light shade, 75c; medium light shade, 80c; medium shade, 85c; deep shade, 90c, maroon, $1.00 All the shades of yellow, primrose, lemon, golden, and orange are quoted at 50c. Single shipments of 1 ton or more to one destination (reds or yellows separately, not combined) are 5c a lb. lower than the prices quoted above.

A number of prices were renewed for the second quarter, including ester gum, iron blues, iron oxides, stearates, zinc oxides (the 35% and 50% leaded oxides at the new basis of Mar. 10); white lead on the basis established on Mar. 10; titanium pigments, etc.

While price stability has marked the carbon black market for several weeks now, and the recent freight rate increase was passed on to the consumers, there is still some feeling in the industry that further attempts may be made by one of the producers to force a differential between the carlot bag price and the tank-car quotation.

Weakness developed in zinc immediately after the bearish February statistics were released. Stocks of slab zinc on Feb. 28 totaled 108,138 tons, as compared with 88,532 on Jan. 31, and but 24,616 on Feb. 28, '37. Shipments in February amounted to 21,540 tons, as compared with 24,931 in January, and 46,943 in February of last year. Production was 41,146 tons, against 48,687 in January, and 37,794 in February of '37. Rise in stocks within 6 months, from a low of 11,227 tons at the end of August to 108,138 tons, probably was more rapid than ever before in a similar period, hence the feeling of uncertainty over future price trend. The statistics were released Mar. 8. On Mar. 9 a ¼c reduction was made, bringing the E. St. Louis quotation to 4½c. Another ¼c reduction brought the market to 4¼c where it closed the month.

Lead statistics were just as bearish and the price of the metal sank last month to $4.50 per 100 lbs., equal to the previous low of Feb. 10.

S.-W. in Titanium Pigments

A new titanium pigment producer appeared to be a certainty last month when Sherwin-Williams reported purchase of a 20-acre plot at Gloucester, N. J., on the Delaware River, for the purpose of erecting a titanium pigment plant.

Stocks Register Sharp Declines

Loss in March Greatest Since September, 1931—Allied Off 43 Points—Allied Report for '37 Shows Net Income of $24,770,845, a Slight Drop From '36 Total—Cyanamid Net Up in Past Year—Carbide's Net Earnings Rose in '37—

March was a month of despair on the stock market. Fortunately for general sentiment the first few days of April witnessed a sharp rally; whether it is the forerunner of a sustained improvement no one can even hazard a guess for foreign, domestic, political, and business affairs are in a most disconcerting state of uncertainty.

In the month just completed the *N. Y. Times* index of 50 stocks showed a net loss of 21.66 points, the widest March decline since the compilation was started nearly 30 years ago. The decline was the greatest of any month since September, '31, and ranked next in order to the severe declines of October and November of '29, and of June and September, '30. Before the recovery set in on April 1, the index touched its lowest level since May, '33.

The stock market in March was forced to face probably one of the most trying months in years. Despite a little improvement in the general business tone, the balance of the month's happenings were decidedly of a bearish nature. The annexation of Austria by Hitler, the flare-up in the TVA authority set-up, the fight on the President's reorganization bill were some of the more important foreign and domestic happenings that created misgivings in the minds of investors and increased the volume of stock liquidation.

Chemical common stock values melted away rapidly in the general market rout. Allied sustained a 43 point loss, du Pont a 24½ point drop, and Monsanto a 20⅛ loss. Carbide fell 19½ points in the 31-day period.

Trading in stocks in March amounted to 23,000,335 shares, compared with 14,524,824 in February and 50,344,350 shares in March of '37. March financing was the lowest for that month since '34, while the aggregate of March dividends was the smallest for any month since April, '36, and amounted to only $203,626,918, as against $282,103,222 in the same month of the previous year.

Earnings Statements

Allied Chemical and Dye in its report for '37 shows net income, after taxes, depreciation and expenses, of $24,770,845, equal to $11.19 a share. This compared with net income of $25,323,834, or $11.44 a share, in the preceding year. Gross income, other than dividends and interest, amounted to $26,902,039, against $27,682,504, and gross income, including dividend and interest income, amounted to $29,634,578, compared with $30,085,436.

H. F. Atherton, president, in his report to stockholders, states the dollar value of the company's business in '37 was the largest in its history, exceeding '29. In comparison with '29 company's selling prices of heavy chemicals, alkalies and nitrogen products were reduced by about 24%, while total taxes were up approximately 60%; hourly wage rates at the end of '37 were higher by 20%, and net income remaining as compensation to the stockholders for the use of assets diminished 18%.

"The basic industries which the company served registered a marked improvement during the first half of '37, but a reversal in trend occurring in July resulted in a sharp and continuous decline in the company's sales throughout the balance of the year," Mr. Atherton said.

The balance sheet showed that marketable securities on Dec. 31, '37, consisted of 150,500 shares of common stock of U. S. Steel and 270,000 shares of capital stock of Air Reduction, which had a total market value at the year-end of $21,492,000, compared with cost of $15,276,512.

Cyanamid Reports $2.09 a Share

American Cyanamid reports a net profit last year of $5,268,255, equal to $2.09 a share on its common stock, against $4,454,930, or $1.77 a share in '36. Most of the year's profits apparently were earned in the first 9 months, and the final period contributed little to net on account of the slump in business in the final months of the year.

Cyanamid put itself in strong financial position during the year for both working capital needs and possible future expansion by selling $6,000,000 4% debentures. Cash at the year end amounted to $11,050,231, against $8,565,602 a year previous. Decline in the company's business from the '36 level is shown by a drop of about 20% in accounts receivable to $4,714,438 from $5,636,873 in '36. Inventories increased to $16,684,606 from $13,383,062, up roughly 25%. Additions and extensions to plants amounted to $4,615,137, against $3,964,496 in '36 and $2,966,283 in '35, making a total of more than $11,500,000 in 3 years.

Carbide Net $42,782,127

Union Carbide and Carbon reports for '37 a net income of $42,782,127, equal to $4.75 a capital share outstanding, against $36,852,208, or $4.09 a share, in '36. Earnings after income taxes and surtax on undistributed profits were $52,996,286 in '37. Earned surplus increased from $71,873,051 to $72,619,626 in '37.

Canadian Industries Profits Rose in '37

Report of Canadian Industries, Ltd., for year ended Dec. 31, '37, certified by independent auditors, shows net income of $5,721,682, including $949,757 income from investments, and after depreciation, income taxes and other deductions, equivalent after 7% preferred dividend requirements, to $7.86 a share on combined 686,276 no-par shares of Class A and Class B common stocks.

This compares with net income in '36 of $4,729,330, including $935,993 income from investments, equal to $6.45 a share on combined 683,000 shares of Class A and B common stocks.

T. G. S. Earns $3.02 a Share

Net income of Texas Gulf Sulphur amounted to $11,589,281 after depreciation, amortization and Federal income taxes. This is equivalent to $3.02 a share on the 3,840,000 shares of no-par capital stock and is compared to $9,853,014, or $2.56 a share earned in the previous year. Company said it had no liability for surtax on undistributed profits.

Current assets as of Dec. 31, '37, were put at $14,146,426 and current liabilities at $2,996,061. At the close of '36 current assets were $13,020,685 and current liabilities, $2,887,496.

Other Earnings Reported in March

Duval Texas Sulphur reports a net income in '37 of $215,792, equal to 43c a share on 500,000 no-par capital shares, against $306,246, or 61c a share, in '36. Current assets on Dec. 31 last were $1,089,492 and current liabilities $218,277, compared with $938,272 and $183,565, respectively, at the close of '36.

Despite a disappointing fourth quarter, total sales by Merck were higher in '37 than in '36. Consolidated net income amounted to $1,095,248, against $1,048,222 during '36.

Lindsay Light & Chemical reports a '37 net income after surtax of $30,291, equal to 24c each on 60,000 shares of $10-par common stock, against $26,809 or 18c a common share in '36.

Dividend News

Glidden directors took no action Mar. 7 on the common dividend. Company has been paying 50c quarterly. Regular quarterly dividend of 56¼c on the preferred was declared.

Board of Directors of Hercules Powder on Mar. 30 declared a regular quarterly dividend of 1½% on its preferred stock. Dividend is payable May 14 to stockholders of record May 3.

Admitted to List

Abbott Laboratories 4½% cumulative convertible preferred stock, $100 par value, has been admitted to the N. Y. Stock Exchange list.

Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f. o. b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1937 Average $1.10 - Jan. 1937 $1.11 - March 1938 $1.21

	Current Market	1938 Low	1938 High	1937 Low	1937 High
Acetaldehyde, drs, c-l, wks lb.	...	.14	...	.14	...	.14
Acetaldol, 95%, 50 gal drs wks lb.	.21	.25	.21	.25	.21	.25
Acetamide, tech, lcl, kegs lb.	.39	.43	.32	.43	.32	.43
Acetanalid, tech, 150 lb bbls lb.	...	.32	.29	.32	.24	.29
Acetic Anhydride, drs, f.o.b. wks, frt all'd lb.	.10½	.11	.10½	.11	.13	.15
Acetin, tech, drs lb.	...	.33	...	.33	.22	.33
Acetone, tks, f.o.b. wks, frt all'd lb.	...	.04¾	...	.04¾	.04¾	.06½
drs, c-l, f.o.b. wks, frt all'd lb.	...	.05¾	...	.05¾	.05¾	.07½
Acetyl chloride, 100 lb cbys lb.	.55	.68	.55	.68	.55	.68
ACIDS						
Abietic, kgs, bbls lb.	.09¾	.10	.09¾	.10	.06¾	.10
Acetic, 28%, 400 lb bbls, c-l, wks 100 lbs.	...	2.23	...	2.23	2.23	2.53
glacial, bbls, c-l, wks 100 lbs.	...	7.62	...	7.62	7.62	8.70
glacial, USP, bbls, c-l, wks 100 lbs.	...	10.25	...	10.25	10.50	12.43
Acetylsalicylic, USP, 225 lb bbls lb.	...	.60	...	.60	.50	.60
Adipic, kgs, bbls lb.	...	.72	...	.72	...	.72
Anthranilic, ref'd, bbls lb.	1.15	1.20	1.15	1.20	.85	1.00
tech, bbls lb.	...	.75	...	.75	...	.75
Battery, cbys, wks 100 lbs.	1.60	2.55	1.60	2.55	1.35	2.60
Benzoic, tech, 100 lb kgs lb.	.43	.47	.43	.47	.43	.47
USP, 100 lb kgs lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, 80 tons, bgs, delv ton *a*	...	95.00	...	95.00	...	95.00
Broenner's, bbls lb.	...	1.11	...	1.11	...	1.11
Butyric, edible, c-l, wks, cbys lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs, wks lb.	...	.22	...	.22	...	.22
wks, lcl lb.	...	.23	...	.23	...	.23
tks, wks lb.	...	.21	...	.21	...	.21
Camphoric, drs lb.	5.50	5.70	5.50	5.70	5.50	5.70
Chicago, bbls lb.	...	2.10	...	2.10	...	2.10
Chlorosulfonic, 1500 lb drs, wks lb.	.03½	.05	.03½	.05	.03½	.05
Chromic, 99¾%, drs, delv lb.	.15¼	.17¼	.15¼	.17¼	.15¼	.16¾
Citric, USP, crys, 230 lb bbls lb. *b*	.24	.25	.24	.25	.24	.26
anhyd, gran, bbls lb. *b*	...	.26½	...	.26½	.26½	.29
Cleve's, 250 lb bbls lb.	.50	.52	.50	.52	.50	.52
Cresylic, 99%, straw, HB, drs, wks, frt equal gal.	.89	.91	.89	.91	.72	.91
99%, straw, LB, drs, wks, frt equal gal.	.92	.94	.92	.94	.77	.94
resin grade, drs, wks, frt equal lb.	.10¾	.11¼	.10¾	.11¼	.09	.11¼
Crotonic, bbls, delv lb.	.21	.50	.21	1.00	.75	1.00
Formic, tech, 140 lb drs lb.	.10½	.11½	.10½	.11½	.10½	.13
Fumaric, bbls lb.	...	.60	...	.60	...	.60
Fuming, see Sulfuric (Oleum)						
Gallic, tech, bbls lb.	.75	.79	.75	.79	.65	.75
USP, bbls lb.	.87	.91	.87	.91	.77	.91
Gamma, 225 lb bbls, wks lb.	...	.85	...	.85	...	.85
H, 225 lb bbls, wks lb.	.50	.55	.50	.55	.50	.55
Hydriodic, USP, 10% sol, cbys lb.	.50	.51	.50	.51	.50	.51
Hydrobromic, 34% conct 155 lb cbys, wks lb.	.42	.44	.42	.44	.40	.42
Hydrochloric, see muriatic						
Hydrocyanic, cyl, wks lb.	.80	1.30	.80	1.30	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks lb.	.07	.07½	.07	.07½	.07	.07½
Hydrofluosilicic, 35%, 400 bbls, wks lb.	.10½	.15	.10½	.15	.10½	.15
Lactic, 22%, dark, 500 lb bbls lb.	.02½	.02¾	.02½	.02¾	.02½	.02¾
22%, light ref'd, bbls lb.	.03½	.03¾	.03½	.03¾	.03½	.03¾
44%, light, 500 lb bbls lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
44%, dark, 500 lb bbls lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾
50%, water white, 500 lb bbls lb.	.10½	.11½	.10½	.11½	.10½	.11½
USP X, 85%, cbys lb.	.42	.45	.42	.45	.42	.50
Lauric, drs lb.	.08½	.09	.08½	.09	...	...
Laurent's, 250 lb bbls lb.	.45	.46	.45	.46	.45	.46
Levulinic, 5 lb bot, wks lb.	...	2.00	...	2.00	...	...
Linoleic, bbls lb.	...	.20	...	.20	.16	.20
Maleic, powd, kgs lb.	.30	.40	.30	.40	.29	.40
Malic, powd, kgs lb.	.45	.60	.45	.60	.45	.60
Metanillic, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks N unit	.06½	.07¼	.06½	.07¼	.06½	.07¼
S unit	.008	.009	.008	.009	.008	.009
Monochloracetic, tech, bbls lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls lb.	1.50	1.60	1.50	1.60	1.50	1.60
Muriatic, 18°, 120 lb cbys, c-l, wks 100 lb.	...	1.50	...	1.50	1.35	1.50
tks, wks 100 lb.	...	1.00	...	1.00	...	1.00
20°, cbys, c-l, wks 100 lb.	...	1.75	...	1.75	1.45	1.75
tks, wks 100 lb.	...	1.10	...	1.10	...	1.10
22°, c-l, cbys, wks 100 lb.	...	2.25	...	2.25	1.95	2.25
tks, wks 100 lb	...	1.60	...	1.60	...	1.60
CP, cbys lb.	.06½	.07⅛	.06½	.07⅛	.06½	.07⅛
N & W, 250 lb bbls lb.	.85	.87	.85	.87	.85	.87
Naphthenic, 240-280 s.v., drs lb.	.10	.13	.10	.13	.10	.14
Sludges, drs lb.	...	.05	...	.05	.05	.10
Naphthionic, tech, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys, c-l, wks 100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks 100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks 100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv lb.	.11½	.12½	.11½	.12½	.11½	.12½
Oxalic, 300 lb bbls, wks, or N Y lb.	.10¾	.12	.10¾	.12	.10¾	.12
Phosphoric, 85%, USP, cbys lb.	.12	.14	.12	.14	.12	.14
50%, acid, c-l, drs, wks lb.	.06	.08	.06	.08	.06	.08
75%, acid, c-l, drs, wks lb.	.09	.10½	.09	.10½	.09	.10½
Picramic, 300 lb bbls, wks lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks lb.	.35	.40	.35	.40	.35	.40
Propionic, 98% wks, drs lb.	...	.22	...	.22	.20	.22
80% lb.	.16	.17½	.16	.17½	.16	.17½
Pyrogallic, tech, lump, pwd, bbls lb.	...	1.05	...	1.05	...	...
cryst, USP lb.	1.45	1.63	1.45	1.63	1.30	1.48
Ricinoleic, bbls lb.	...	.38	...	.38	.35	.38
tech, bbls lb.	...	.13	...	.13	...	...
Salicylic, tech, 125 lb bbls, wks lb.	...	.33	...	.33	...	.33
USP, bbls lb.	.40	.45	.40	.45	...	...
Sebacic, tech, drs, wks lb.	.37	.41	.37	.41	.37	.41
Succinic, bbls lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb bbls, wks lb.	.17	.18	.17	.18	.17	.18
Sulfuric, 60°, tks, wks ton	...	13.00	...	13.00	12.00	13.00
c-l, cbys, wks 100 lb.	...	1.25	...	1.25	1.10	1.25
66°, tks, wks ton	...	16.50	...	16.50	15.50	16.50
c-l, cbys, wks 100 lb.	...	1.50	...	1.50	1.35	1.50
CP, cbys, wks lb.	.06½	.07½	.06½	.07½	.06½	.07½
Fuming (Oleum) 20% tks, wks ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls lb.	.40	.47	.40	.47	.19	.47
Tartaric, USP, gran, powd, 300 lb bbls lb.	.25¼	.25¾	.24¼	.25¾	.21¾	.25¼
Tobias, 250 lb bbls lb.	.65	.67	.65	.67	.65	.67
Trichloroacetic bottles lb.	2.00	2.50	2.00	2.50	2.00	2.50
kgs lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls lb.	no price					
Vanadic, drs, wks lb.	1.10	1.20	1.10	1.20	1.10	1.20
Albumen, light flake, 225 lb bbls lb.	.52	.60	.52	.60	.47	.60
dark, bbls lb.	.11	.15	.11	.15	.11	.17
egg, edible lb.	1.10	1.15	1.05	1.15	.76	1.15
vegetable, edible lb.	.74	.78	.74	.78	.76	.78
Alcohol, Amyl (from Pentane) tks, delv lb.	...	.123	...	.123	...	.123
c-l, drs, delv lb.	...	.133	...	.133	...	.133
lcl, drs, delv lb.	...	.143	...	.143	...	.143
Amyl, secondary, tks, delv lb.	...	.08½	...	.08½	...	.08½
drs, c-l, delv E. of Rockies lb.	...	.09½	...	.09½	...	...
Benzyl, cans lb.	.68	1.00	.68	1.00	.65	1.10
Butyl, normal, tks, f.o.b. wks, frt all'd lb. *d*	...	.09	...	.09	.08½	.09
c-l, drs, f.o.b. wks, frt all'd lb. *d*	...	.10	...	.10	.09½	.10
Butyl, secondary, tks, delv lb. *d*	...	.06	...	.06	.06	.07
c-l, drs, delv lb. *d*	...	.07	...	.07	.07	.08
Capryl, drs, tech, wks lb.	...	.85	...	.85	...	.85
Cinnamic, bottles lb.	2.00	2.50	2.00	2.50	2.00	3.65
Denatured, CD, No. 11, 12, 13, c-l, drs, wks gal. *e*	...	.33	.33	.35	.33	.35
tks, East, wks gal.	...	.27	.27	.29	...	...
Western schedule, c-l, drs, wks gal. *e*	...	.26	.26	.28	.37	.39
Denatured, SD, No. 1, tks	...	.25	.25	.27	.26	.27
c-l, drs, wks gal. *e*	...	.31	.31	.33	.32	.33

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls.; *y* Price given is per gal.

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case.

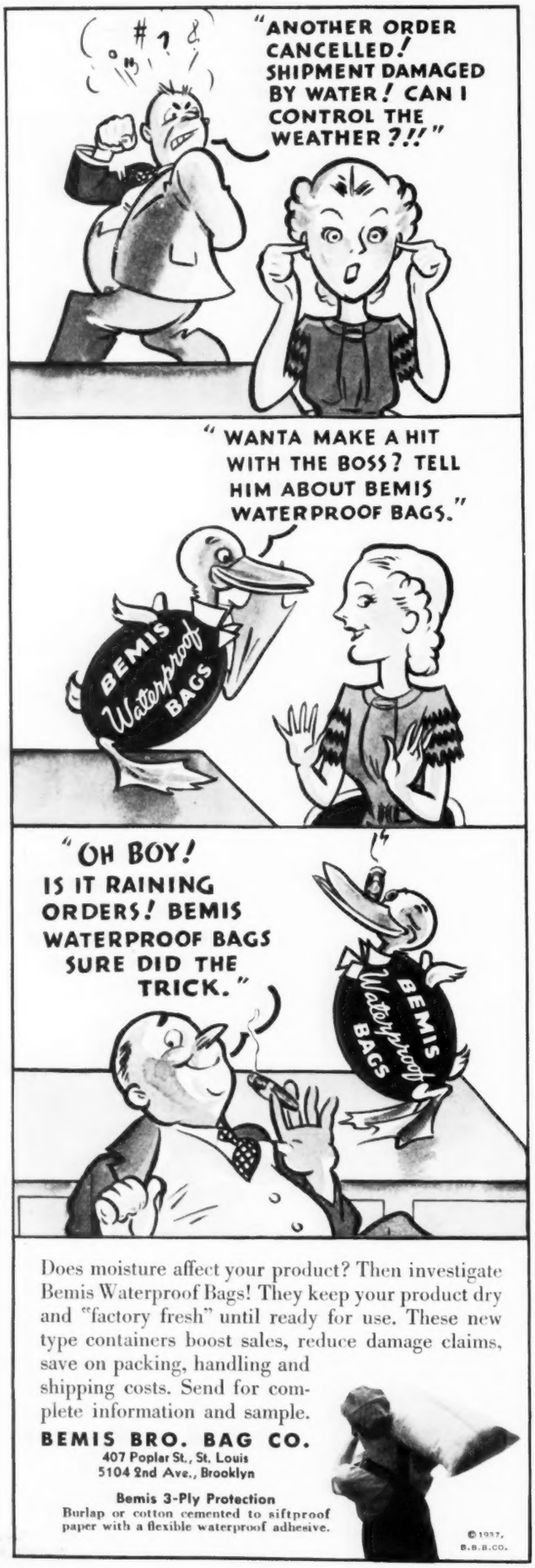
ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Alcohols (continued):						
Diacetone, pure, c-l, drs, delv	lb. *f*	...	.11½	...	.11½	... .11½
tech, contract, drs, c-l, delv	lb.	...	.10½	...	.10½	... ...
Ethyl, 190 proof, molasses, tks	gal. *g*	...	4.04	4.04	4.06	4.05 4.07
c-l, drs	gal. *g*	...	4.10	4.10	4.12	4.11 4.12
c-l, bbls	gal. *g*	...	4.11	4.11	4.13	4.12 4.13
absolute, drs	gal. *g*	4.40	4.45	4.40	4.47	4.54 6.08½
Furfuryl, tech, 500 lb drs	lb.	.30	.35	.30	.35	.30 .35
Hexyl, secondary tks, delv	lb.	...	.12	...	.12	.11½ .12
c-l, drs, delv	lb.	...	.13	...	.13	.12½ .13
Normal, drs, wks	lb.	3.25	3.50	3.25	3.50	3.25 3.50
Isoamyl, prim, cans, wks	lb.	...	.32	...	.32	... .32
drs, lcl, delv	lb.	...	.27	...	.27	... .27
Isobutyl, ref'd, lcl, drs	lb.	...	.10	...	.10	... .10
c-l, drs	lb.	...	.09½	...	.09½	... .09½
tks	lb.	...	.08½	...	.08½	... .08½
Isopropyl, ref'd, 91%, c-l, drs, f.o.b. wks, frt all'd	lb.	...	.36	...	.36	.39½ .45
Ref'd 98%, drs. f.o.b. wks, frt all'd	gal.	...	.41	...	.41	... ...
Tech 91%, drs, above terms	gal.	...	.33½	...	.33½	... ...
tks, same terms	gal.	...	.28½	...	.28½	... ...
Tech 98%, drs, above terms	gal.	...	.37½	...	.37½	... ...
tks, above terms	gal.	...	.32½	...	.32½	... ...
Spec Solvent, tks, wks	gal.	...	.26	.26	.28	.27 .28
Aldehyde ammonia, 100 gal drs	lb.	.80	.82	.80	.82	.80 .82
Aldehyde Bisulfite, bbls, delv	lb.	...	.17	...	.17	... ...
Aldol, 95%, 55 and 110 gal drs, delv	lb.	...	.20	...	.20	... ...
Alphanaphthol, crude, 300 lb bbls	lb.	...	.52	...	.52	... .52
Alphanaphthylamine, 350 lb bbls	lb.	.32	.34	.32	.34	.32 .34
Alum, ammonia, lump, c-l, bbls, wks	100 lb.	3.40	3.65	3.40	3.65	3.00 3.25
delv NY, Phila	100 lb.	...	3.40	...	3.40	3.15 3.40
Granular, c-l, bbls. wks	100 lb.	3.15	3.40	3.15	3.40	2.75 3.00
Powd, c-l, bbls, wks	100 lb.	...	3.55	...	3.55	3.15 3.40
Chrome, bbls	100 lb.	6.50	6.75	6.50	6.75	6.50 7.25
Potash, lump, c-l, bbls, wks	100 lb.	3.65	3.90	3.65	3.90	3.25 3.50
Granular, c-l, bbls, wks	100 lb.	3.40	3.65	3.40	3.65	3.00 3.25
Powd, c-l, bbls, wks	100 lb.	3.80	4.05	3.80	4.05	3.40 3.65
Soda, bbls, wks	100 lb.	...	3.25	...	3.25	... 3.25
Aluminum metal, c-l, NY	100 lb.	...	20.00	...	20.00	19.00 20.00
Acetate, 20%, bbls	lb.	.07½	.09	.07½	.10	.09 .10
Basic powd, bbls, delv	lb.	.40	.50	.40	.50	... ...
Chloride anhyd, 99%, wks	lb.	.07	.12	.07	.12	.07 .12
93%, wks	lb.	.05	.08	.05	.08	.05 .08
Crystals, c-l, drs, wks	lb.	.06	.06¼	.06	.06¼	.06 .06¼
Solution, drs, wks	lb.	.02¾	.03¼	.02¾	.03¼	.02¾ .03¼
Formate, 30% sol bbls, c-l, delv	lb.	...	.13	...	.13	... ...
Hydrate, 96%, light, 90 lb bbls, delv	lb.	.12	.13	.12	.13	.13 .15
heavy, bbls, wks	lb.	.029	.03½	.029	.03½	.029 .03½
Oleate, drs	lb.	.16¾	.18½	.16¾	.18½	.16¾ .18½
Palmitate, bbls	lb.	...	.23	...	.23	.22 .23
Resinate, pp., bbls	lb.	...	.15	...	.15	... .15
Stearate, 100 lb bbls	lb.	.19	.21	.19	.21	.19 .21
Sulfate, com, c-l, bgs, wks	100 lb.	...	1.35	...	1.35	... 1.35
c-l, bbls, wks	100 lb.	...	1.55	...	1.55	... 1.55
Sulfate, iron-free, c-l, bgs, wks	100 lb.	...	2.00	...	2.00	... 1.90
c-l, bbls, wks	100 lb.	...	2.20	...	2.20	... 2.05
Aminoazobenzene, 110 lb kgs	lb.	...	1.15	...	1.15	... 1.15
Ammonia anhyd fert com, tks	lb.	.04½	.05½	.04½	.05½	.04½ .05½
Ammonia anhyd, 100 lb cyl	lb.	.16	.22	.16	.22	.16 .22
26°, 800 lb drs, delv	lb.	.02¼	.02½	.02¼	.02½	.02¼ .02½
Aqua 26°, tks, NH	cont.	...	.05	...	.05	.04½ .05
tk wagon	lb.	...	.02	...	.02	... .02
Ammonium Acetate, kgs	lb.	.26	.33	.26	.33	.26 .33
Bicarbonate, bbls, f.o.b. wks	100 lb.	5.15	5.71	5.15	5.71	5.15 5.71
Bifluoride, 300 lb bbls	lb.	.16	.17	.16	.17	.16 .17
carbonate, tech, 500 lb bbls	lb.	.08	.12	.08	.12	.08 .12
Chloride, White, 100 lb bbls, wks	100 lb.	4.45	4.90	4.45	4.90	4.45 4.90
Gray, 250 lb bbls, wks	100 lb.	5.50	6.25	5.50	6.25	5.00 6.25
Lump, 500 lbs cks spot	lb.	.10½	.11	.10½	.11	.10½ .11
Lactate, 500 lb bbls	lb.	.15	.16	.15	.16	.15 .16
Laurate, bbls	lb.	...	.23	...	.23	... ...
Linoleate, 80% anhyd, bbls	lb.	...	.15	...	.15	.11 .15
Naphthenate, bbls	lb.	...	.17	...	.17	... ...
Nitrate, tech, cks	lb.	.038	.0405	.038	.0405	.03¾ .04
Oleate, drs	lb.	...	.15	...	.15	.15 .10
Oxalate, neut, cryst, powd, bbls	lb.	.19	.20	.19	.22½	.22½ .23
Perchlorate, kgs	lb.	...	.16	...	.16	... .16
Persulfate, 112 lb kgs	lb.	.21	.24	.21	.24	.21 .24
Phosphate, dibasic tech, powd, 325 lb bbls	lb.	.07½	.10	.07½	.10	.07½ .10
Ricinoleate, bbls	lb.	...	.15	...	.15	... ...
Stearate, anhyd, bbls	lb.	...	.24	...	.24	... ...
Paste, bbls	lb.	...	.07½	...	.07½	... ...

g Grain alcohol 20c a gal. higher in each case.

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Ammonium (continued).						
Sulfate, dom, f.o.b., bulk	ton	...	28.50	...	28.50	26.00 28.00
200 lb bgs	ton	...	29.80	...	29.80	... 29.30
100 lb bgs	lb.	...	30.50	...	30.50	... 30.00
Sulfocyanide, pure, kgs	lb.	...	.55	...	.55	... .55
Amyl Acetate (from pentane) tks, delv	lb.	...	.11½	...	.11½	... .11½
tech, drs, delv	lb.	...	.12	...	.12	.11½ .13½
Secondary, tks, delv	lb.	...	.08½	...	.08½	... .08½
c-l, drs, delv	lb.	...	.09½	...	.09½	... .09½
tks, delv	lb.	...	.08½	...	.08½	... .08½
Chloride, norm, drs, wks	lb.	.56	.68	.56	.68	.56 .68
mixed, drs, wks	lb.	.07	.077	.07	.077	.07 .077
tks, wks	lb.	...	.06	...	.06	... .06
Mercaptan, drs, wks	lb.	...	1.10	...	1.10	... 1.10
Oleate, lcl, wks, drs	lb.	...	.25	...	.25	... .25
Stearate, lcl, wks, drs	lb.	...	.26	...	.26	... .26
Amylene, drs, wks	lb.	.102	.11	.102	.11	.102 .11
tks, wks	lb.	...	.09	...	.09	... .09
Aniline Oil, 960 lb drs and tks	lb.	.14½	.17½	.14½	.17½	.15 .17½
Annatto fine	lb.	.34	.37	.34	.37	.34 .37
Anthracene, 80%	lb.	...	.75	...	.75	... .75
40%	lb.	...	.18	...	.18	... .18
Anthraquinone, sublimed, 125 lb bbls	lb.	...	.65	...	.65	.50 .65
Antimony metal slabs, ton lots	lb.	.13¾	.14	.13¾	.14	.13⅝ .17¼
Butter of, see Chloride.						
Chloride, soln cbys	lb.	...	.17	...	.17	... .17
Needle, powd, bbls	lb.	.14	.16	.14	.16	.14 .19½
Oxide, 500 lb bbls	lb.	.12½	.13	.12½	.16½	.14¼ .16¾
Salt, 63% to 65%, tins	lb.	.26	.27	.26	.27	.22 .24
Sulfuret, golden, bbls	lb.	.22	.23	.22	.23	.22 .23
Archil, conc, 600 lb bbls	lb.	.21	.27	.21	.27	.21 .27
Double, 600 lb bbls	lb.	.18	.20	.18	.20	.18 .20
Aroclors, wks	lb.	.18	.30	.18	.30	.18 .30
Arrowroot, bbl	lb.	.08½	.09	.08½	.09	.08½ .09¾
Arsenic, Metal	lb.	.42	.44	.42	.44	.42 .44
Red, 224 lb cs kgs	lb.	...	.15¾	...	.15¾	... .15¾
White, 112 lb kgs	lb.	.03	.04	.03	.04	.03 .04
Barium Carbonate precip, 200 lb bgs, wks	ton	52.50	62.50	52.50	62.50	52.50 62.50
Nat (witherite) 90% gr, c-l, wks, bgs	ton	...	44.00	...	44.00	42.00 45.00
Chlorate, 112 lb kgs, NY	lb.	.16½	.17½	.16½	.17½	.16½ .17½
Chloride, 600 lb bbls, delv, zone 1	ton	77.00	92.00	77.00	92.00	74.00 92.00
Dioxide, 88%, 690 lb drs	lb.	.11	.12	.11	.12	.11 .12
Hydrate, 500 lb bbls	lb.	.04¾	.05½	.04¾	.05½	.04¾ .05½
Nitrate, bbls	lb.	.07	.08¼	.07	.08¼	.07 .08¼
Barytes, floated, 350 lb bbls c-l, wks	ton	...	23.65	...	23.65	... 23.65
Bauxite, bulk, mines	ton	7.00	10.00	7.00	10.00	7.00 10.00
Bentonite, c-l, 325 mesh, bgs, wks	ton	...	16.00	...	16.00	... 16.00
200 mesh	ton	...	11.00	...	11.00	... 11.00
Benzaldehyde, tech, 945 lb drs, wks	lb.	.60	.62	.60	.62	.60 .62
Benzene (Benzol), 90%, Ind, 8000 gal tks, ft all'd	gal.	...	.16	...	.16	... .16
90% c-l, drs	gal.	...	.21	...	.21	... .21
Ind pure, tks, frt all'd	gal.	...	.16	...	.16	... .16
Benzidine Base, dry, 250 lb bbls	lb.	.70	.72	.70	.72	.70 .72
Benzoyl Chloride, 500 lb drs	lb.	.40	.45	.40	.45	.40 .45
Benzyl Chloride, 95-97% rfd, drs	lb.	.30	.40	.30	.40	.30 .40
Tech, drs	lb.	.25	.26	.25	.26	.25 .26
Beta-Naphthol, 250 lb bbl, wks	lb.	.23	.24	.23	.24	.23 .24
Naphthylamine, sublimed, 200 lb bbls	lb.	1.25	1.35	1.25	1.35	1.25 1.35
Tech, 200 lb bbls	lb.	.51	.52	.51	.52	.51 .52
Bismuth metal	lb.	1.00	1.10	1.00	1.10	1.00 1.10
Chloride, boxes	lb.	3.20	3.25	3.20	3.25	3.20 3.25
Hydroxide, boxes	lb.	3.15	3.20	3.15	3.20	3.15 3.20
Oxychloride, boxes	lb.		2.95		2.95	2.75 3.04
Subbenzoate, boxes	lb.	3.25	3.30	3.25	3.30	3.25 3.30
Subcarbonate, kgs	lb.	1.13	1.16	1.13	1.58	1.23 1.58
Trioxide, powd, boxes	lb.		3.57		3.57	3.45 3.57
Subnitrate, fibre, drs	lb.	1.03	1.06	1.03	1.48	1.22 1.48
Blackstrap, cane (see Molasses, Blackstrap).						
Blanc Fixe, 400 lb bbls, wks	ton *h*	40.00	75.00	40.00	75.00	40.00 75.00
Bleaching Powder, 800 lb drs, c-l, wks, contract	100 lb.		2.00		2.00	... 2.00
lcl, drs, wks	lb.	2.25	3.60	2.25	3.60	2.25 3.60
Blood, dried, f.o.b., NY	unit	...	2.85	2.85	3.10	3.10 4.30
Chicago, high grade	unit	...	3.00	3.00	3.35	3.00 4.65
Imported shipt	unit	...	3.15	3.15	3.45	3.25 4.10
Blues, Bronze Chinese Milori Prussian Soluble	lb.	.36	.37	.36	.37	.36 .37
Ultramarine,* dry, wks, bbls	lb.	...	.11	...	.11	.10 .11
Regular grade, group 1	lb.	...	.16	...	.16	.15 .16
Special, group 1	lb.	...	.19	...	.19	.18 .19
Pulp, No. 1	lb.	...	.27	...	.27	.26 .27
Bone, 4½ + 50% raw, Chicago	ton	26.00	29.00	26.00	30.00	26.00 30.00
Bone Ash, 100 lb kgs	lb.	.06	.07	.06	.07	.06 .07
Black, 200 lb bbls	lb.	.06½	.08¼	.06½	.08¼	.05½ .08¼
Meal, 3% & 50%, imp	ton		22.00	22.00	23.75	23.75 27.50
Domestic, bgs, Chicago	ton	18.00	19.00	18.00	22.00	19.00 27.00
Borax, tech, gran, 80 ton lots, sacks, delv	ton *i*	...	42.00	...	42.00	40.00 42.00
bbls, delv	ton *i*	...	52.00	...	52.00	50.00 52.00

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.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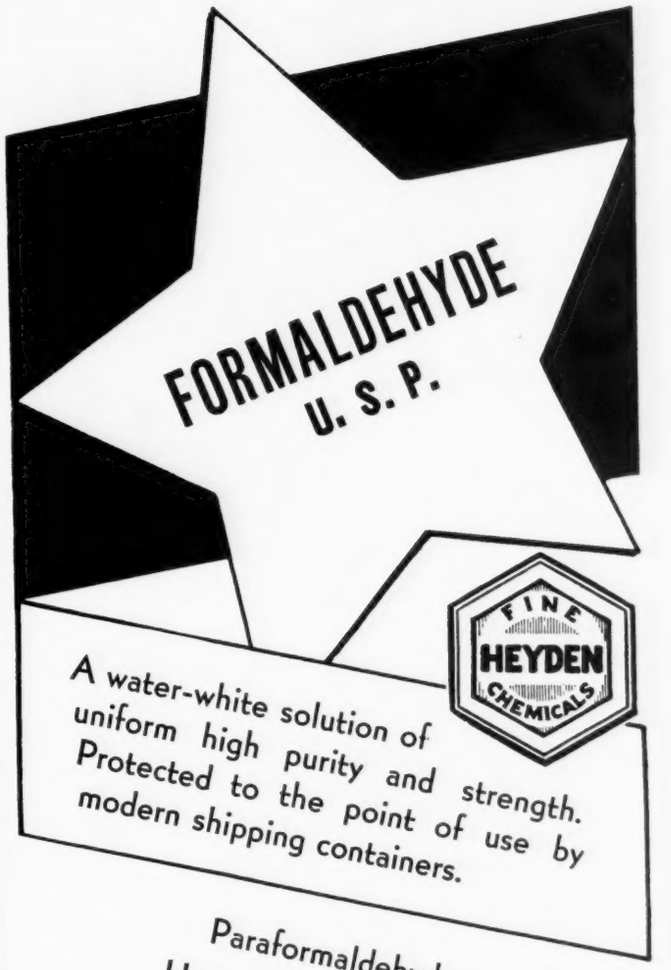
Prices

	Current Market	1938 Low	1938 High	1937 Low	1937 High
Borax (continued):					
Tech, powd, 80 ton lots, sacks ton *j*	...	47.00	...	47.00	45.00	47.00
bbls, delv ton *j*	...	57.00	...	57.00	56.00	57.00
Bordeaux Mixture, drs lb.	.11	.11½	.11	.11½	.10½	.11
Bromine, cases lb.	.30	.43	.30	.43	.30	.43
Bronze, Al, pwd, 300 lb drs lb.	.90½	.92½	.90½	.92½	.80	1.50
Gold, blk lb.	.45	.65	.45	.65	.40	.65
Butanes, com 16-32° group 3 tks lb.	.02¼	.03¾	.02¼	.03¾	.02¼	.03¾
Butyl, Acetate, norm drs, frt allowed lb.	.10	.10½	.10	.10½	.10	.10½
tks, frt allowed lb.	...	.09	...	.09	...	.09
Secondary, tks, frt allowed lb.	...	.07	...	.07	.07	.07½
drs, frt, allowed lb.	.08	.08½	.08	.08½	.08	.09
Aldehyde, 50 gal drs, wks lb.	.16½	.17½	.16½	.17½	.16½	.17½
Carbinol, norm drs, wks lb.	.60	.75	.60	.75	.60	.75
Crotonate, norm, 55 and 110 gal drs, delv lb.	...	.36	...	.36	...	...
Lactate lb.	.22½	.23½	.22½	.23½	.22½	.23½
Oleate, drs, frt allowed lb.	...	.25	...	.25	...	.25
Propionate, drs lb.	.18	.18½	.18	.18½	.18	.18½
tks, delv lb.	...	.17	...	.17	...	.17
Stearate, 50 gal drs lb.	...	.26	...	.26	.25	.26
Tartrate, drs lb.	.55	.60	.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	.35½	...	.35½
Cadmium Metal lb.	...	1.35	1.35	1.60	1.05	1.60
Sulfide, orange, boxes lb.	1.50	1.60	1.50	1.60	.90	1.60
Calcium, Acetate, 150 lb bgs c-l, delv 100 lb.	...	1.65	...	1.65	1.65	2.25
Arsenate, c-l, E. of Rockies, dealers, drs lb.	.06¾	.07¼	.06¾	.07¼	.06¼	.07¾
Carbide, drs lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l lb.	...	1.00	...	1.00	...	1.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv ton	...	22.00	22.00	23.50	22.00	23.50
paper bgs, c-l, delv ton	23.00	36.00	23.00	36.00	...	...
Solid, 650 lb drs, c-l, delv ton	...	20.00	20.00	21.50	20.00	21.50
Ferrocyanide, 350 lb bbls wks lb.	...	.17	...	.17	...	.17
Gluconate, Pharm, 125 lb bbls lb.	.50	.57	.50	.57	.50	.57
Levulinate, less than 25 bbl lots, wks lb.	...	3.00	...	3.00	...	...
Nitrate, 100 lb bgs ton	...	28.00	...	28.00	26.10	28.00
Palmitate, bbls lb.	.22	.23	.22	.23	.22	.23
Phosphate, tribasic, tech, 450 lb bbls lb.	.06½	.07½	.06½	.07½	.06½	.07½
Resinate, precip, bbls lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls lb.	.19	.21	.19	.21	.19	.21
Camphor, slabs lb.	.55	.56	.55	.56	.54	.56
Powder lb.	.55	.56	.55	.56	.54	.56
Camwood, Bk, ground bbls lb.	.16	.18	.16	.18	.16	.18
Carbon Bisulfide, 500 lb drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, delv, price varying with zone† lb.	.027	.0380	.027	.0380	.0320	.0535
lcl, bgs, f.o.b. whse lb.	...	.05¾	...	.05¾	.06½	.07
cartons, f.o.b. whse lb.	...	.06¼	...	.06¼	.07	.07¾
cases, f.o.b. whse lb.	...	.07	...	.07	.07¾	.08¼
Decolorizing, drs, c-l lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 55 or 110 gal drs, c-l, delv lb.	.05¼	.06	.05¼	.06	.05¼	.06
Casein, Standard, Dom, grd lb.	.07½	.10	.07½	.13½	.11	.20¾
80-100 mesh, c-l, bgs lb.	.08½	.09	.08½	.14	.11½	.21¼
Castor Pomace, 5½ NH_3, c-l, bgs, wks ton	...	21.00	...	21.00	21.00	25.00
Imported, ship, bgs ton	...	21.00	...	21.00	nom.	17.00
Celluloid, Scraps, ivory cs lb.	.12	.15	.12	.15	.12	.15
Transparent, cs lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, 50 lb kgs lb.	...	.40	...	.40	.40	.55
Chalk, dropped, 175 lb bbls lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks lb.	.03	.04	.03	.04	.03	.04
Light, 250 lb cks lb.	.03¼	.04	.03¼	.04	.03	.04
Charcoal, Hardwood, lump, blk, wks bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* ton	23.00	34.00	23.00	34.00	23.00	34.40
Willow, powd, 100 lb bbl. wks lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified, tks, wks lb.	...	.02125	...	.02125	.01625	.02125
25%, bbls, wks lb.	...	.0225	...	.0225	.02	.0225
Pwd, 60%, 100 lb bgs, wks lb.	...	.04⅞	...	.04⅞	...	.04⅞
China Clay, c-l, blk mines ton	...	7.00	...	7.00	6.50	7.00
Imported, lump, blk ton	22.00	25.00	22.00	25.00	22.00	25.00
Chlorine, cyls, lcl, wks, contract lb.	.07½	.08½	.07½	.08½	.07½	.08½
cyls, c-l, contract lb. *j*	...	.05½	...	.05½	...	.05½
Liq, tk, wks, contract 100 lb.	...	2.15	...	2.15	...	2.15
Multi, c-l, cyls, wks, cont lb.	2.30	2.55	2.30	2.55	2.30	2.55
Chloroacetophenone, tins, wks lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb drs, lcl, wks lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs lb.	.20	.21	.20	.21	.20	.21
USP, 25 lb tins lb.	.30	.31	.30	.31	.30	.31
Chloropicrin: comml cyls lb.	...	.80	...	.80	...	.80
Chrome, Green, CP lb.	.21	.25	.21	.25	.20	.25
Yellow lb.	.14½	.15½	.14½	.15½	.13	.16½

j A delivered price; * Depends upon point of delivery; † New bulk price, tank cars ¼c per lb. less than bags in each zone.

	Current Market	1938 Low	1938 High	1937 Low	1937 High
Chromium, Acetate, 8% Chrome, bbls lb.	.05	.08	.05	.08	.05	.08
Fluoride, powd, 400 lb bbl ..... lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls ..... bbl.	7.50	8.00	7.50	8.00	6.75	9.00
Cobalt Acetate, bbls ..... lb.	.66	.68	.66	.68	.58	.68
Carbonate tech, bbls .... lb.	...	1.63	...	1.63	1.42¾	1.63
Hydrate, bbls ..... lb.	...	1.36	...	1.36	...	...
Linoleate, solid, bbls ... lb.	...	.33	...	.33	.31	.33
paste, 6%, drs ..... lb.	...	.31	...	.31	...	.31
Oxide, black, bgs ..... lb.	...	1.67	...	1.67	1.41	1.67
Resinate, fused, bbls .... lb.	...	.13½	...	.13½	.13	.13½
Precipitated, bbls .... lb.	...	.34	...	.34	.30½	.34
Cochineal, gray or bk bgs. lb.	.35	.38	.35	.38	.32	.38
Teneriffe silver, bgs .... lb.	.36	.39	.36	.39	.33	.39
Copper, metal, electrol 100 lb.	...	10.00	10.00	11.00	11.00	16.25
Acetate, normal, bbls, wks ..... lb.	.21	.23	.21	.23	...	...
Carbonate, 400 lb bbls .. lb.	...	.10¼	.10¼	.10½	.10½	.12½
52-54% bbls ..... lb.	.14½	.15½	.14½	.16¾	.15¾	.19
Chloride, 250 lb bbls .... lb.	.13	.14	.13	.17	.15	.18
Cyanide, 100 lb drs ..... lb.	.37	.38	.37	.38	.37	.38
Oleate, precip, bbls ..... lb.	...	.20	...	.20	...	.20
Oxide, black, bbls, wks .. lb.	.14½	.15	.14½	.17½	.17	.18
red 100 lb bbls ..... lb.	...	.16	.16	.19775	.17	.19975
Resinate, precip, bbls .... lb.	.15	.16	.15	.16	.15	.19
Stearate, precip, bbls .... lb.	.23	.24	.23	.24	.23	.40
Sub-acetate verdigris, 400 lb bbls ..... lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks 100 lb.	...	4.25	...	4.25	4.25	4.50
Copperas, crys and sugar bulk c-l, wks ..... ton	12.00	13.00	12.00	13.00	12.00	13.00
Corn Sugar, tanners, bbls 100 lb.	3.10	3.20	3.10	3.30	3.15	4.34
Corn Syrup, 42°, bbls .. 100 lb.	....	3.04	3.04	3.16	3.11	4.36
43°, bbls ..... 100 lb.	...	3.09	3.09	3.21	3.16	4.41
Cotton, Soluble, wet, 100 lb bbls ..... lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, USP, powd & gran, 300 lb bbls ..... lb.	.21¼	.21¾	.19¾	.21¾	.15	.20¼
Creosote, USP, 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1, tks ..... gal.	.13½	.14	.13½	.14	.13	.14
Grade 2 ..... gal.	.122	.132	.122	.132	.113	.132
Cresol, USP, drs ..... lb.	.12	.12½	.12	.12½	.10	.13
Crotonaldehyde, 97%, 55 and 110 gal drs, delv ..... lb.	...	.22	.22	.30	.26	.30
Cutch, Philippine, 100 lb bale lb.	.04	.04¾	.04	.04¾	.04	.04¾
Cyanamid, bgs, c-l, frt allowed Ammonia ..... unit	....	1.15	...	1.15	1.10	1.15
Derris root 5% rotenone, bbls ..... lb.	.39	.43	.39	.43	.39	.47
Dextrin, corn, 140 lb bgs f.o.b., Chicago .... 100 lb.	3.45	3.65	3.45	3.75	3.50	5.00
British Gum, bgs ... 100 lb.	3.70	3.90	3.70	4.00	3.75	5.25
Potato, Yellow, 220 lb bgs lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
White, 220 lb bgs, lcl .. lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 bgs, lcl .... lb.	...	.0715	.0715	.08	...	.08
White, 140 lb bgs ... 100 lb.	3.40	3.60	3.40	3.70	4.00	4.58
Diamylamine, c-l, drs, wks lb.	.47	.75	.47	.75	.47	.75
Diamylene, drs, wks ..... lb.	.095	.102	.095	.102	.095	.102
tks, wks ..... lb.	...	.08¼	...	.08½	...	.08½
Diamylether, wks, drs .... lb.	.085	.092	.085	.092	.085	.092
tks, wks ..... lb.	...	.075	...	.075	...	.075
Oxalate, lcl, drs, wks ... lb.	...	.30	...	.30	...	.30
Diamylphthalate, drs, wks lb.	.20½	.21	.20½	.21	.19	.21½
Diamyl Sulfide, drs, wks .. lb.	...	1.10	...	1.10	...	1.10
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate, drs, wks ..... lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks lb.	...	.55	...	.55	...	...
Dibutyl Ether, drs, wks, lcl lb.	...	.30	...	.30	...	.30
Dibutylphthalate, drs, wks, frt all'd ..... lb.	...	.21	...	.21	.19½	.21
Dibutyltartrate, 50 gal drs lb.	.45	.54	.45	.54	.35	.50
Dichlorethylene, drs ..... lb.	...	.25	...	.25	.25	.29
Dichloroethylether, 50 gal drs, wks ..... lb.	.15	.16	.15	.16	.15	.16
tks, wks ..... lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, drs, wks lb.	no prices		...	...	...	...
tks, wks ..... lb.	no prices		...	...	...	...
Diethanolamine, tks, wks .. lb.	...	.23	...	.23	.23	.25
Diethylamine, 400 lb drs .. lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethylaniline, 850 lb drs. lb.	.40	.52	.40	.50	.40	.50
Diethyl Carbinol, drs ..... lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs .. lb.	.31¾	.35	.31¾	.35	.31¾	.35
Diethylorthotoluidin, drs .. lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, 1000 lb drs lb.	.19	.19½	.19	.19½	.18	.19½
Diethylsulfate, tech, drs, wks, lcl ..... lb.	.13	.14	.13	.14	.13	.20
Diethyleneglycol, drs ..... lb.	.16	.17	.16	.17	.16	.23
Mono ethyl ethers, drs .. lb.	.15	.16	.15	.16	.15	.17
tks, wks ..... lb.	...	.14	...	.14	.14	.15
Mono butyl ether, drs .. lb.	.23	.24	.23	.24	.23	.26
tks, wks ..... lb.	...	.22	...	.22	...	...
Diethylene oxide, 50 gal drs, wks ..... lb.	.20	.24	.20	.24	.20	.24
Diglycol Oleate, bbls ..... lb.	...	.21	...	.21	.21	.24
Laurate, bbls ..... lb.	...	.27½	...	.27½	...	...
Stearate, bbls ..... lb.	...	.27½	...	.27½	...	...
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ..... lb.	...	1.00	...	1.00	...	.95
Dimethylaniline, 340 lb drs lb.	.26	.27	.26	.27	.26	.27
Dimethyl Ethyl Carbinol, drs lb.	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs, wks, frt allowed ..... lb.	...	.19	...	.19	.20½	.21
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb. *k*	.16	.19	.16	.19	.16	.19

k Higher price is for purified material.



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		Current Market		1938 Low	1938 High	1937 Low	1937 High
Dinitrochlorobenzene, 400 lb bbls	lb.	.13½	.14	.13½	.14	.14	.17½
Dinitronaphthalene, 350 lb bbls	lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls	lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls	lb.	...	.15½	...	.15½	.14½	.15½
Diphenyl, bbls	lb.	.15	.25	.15	.25	.15	.25
Diphenylamine	lb.	.31	.32	.31	.32	.31	.32
Diphenylguanidine, 100 lb drs	lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.							
Divi Divi pods, bgs shipmt	ton	...	nom.	...	nom.	34.00	nom.
Extract	lb.	.05	.05½	.05	.05½	.05	.05½
EGG YOLK							
Egg Yolk, dom., 200 lb cases	lb.	.63	.65	.63	.68	.68	nom.
Imported	lb.	.65	.68	.65	.68	.53	.65
Epsom Salt, tech, 300 lb bbls							
c-l, NY	100 lb.	1.90	2.10	1.90	2.10	1.80	2.10
USP, c-l, bbls	100 lb.	...	2.10	...	2.10	2.00	2.10
Ether, USP anaesthesia 55 lb drs	lb.	.22	.23	.22	.23	.22	.23
(Conc)	lb.	.09	.10	.09	.10	.09	.10
Isopropyl 50 gal drs	lb.	.07	.08	.07	.08	.07	.08
tks, frt allowed	lb.	...	.06	...	.06	...	.06
Nitrous, conc, bottles	lb.	...	.68	...	.68	.68	.77
Synthetic, wks, drs	lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester							
tks, frt all'd	lb.	...	.05½	...	.05½	.05½	.06½
drs, frt all'd	lb.	...	.06½	...	.06½	.06½	.07½
95%, tks, frt allowed	lb.	...	.06¾	...	.06¾	...	.06¾
drs, frt all'd	lb.	...	.07¾	...	.07¾	...	.07¾
Acetoacetate, 110 gal drs	lb.	...	.27½	...	.27½	...	.27½
Benzylaniline, 300 lb drs	lb.	.86	.88	.86	.88	.86	.88
Bromide, tech, drs	lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd	lb.	.70	1.00	.70	1.00	...	...
Chloride, 200 lb drs	lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate, cbys	lb.	...	.30	...	.30	...	.30
Crotonate, drs	lb.	1.00	1.25	1.00	1.25	1.00	1.25
Formate, drs, frt all'd	lb.	.27	.28	.27	.28	.27	.31
Lactate, drs, wks	lb.	...	.33	...	.33	...	.33
Oxalate, drs, wks	lb.	.30	.34	.30	.34	.30	.34
Oxybutyrate, 50 gal drs, wks	lb.	.30	.30½	.30	.30½	.30	.30½
Silicate, drs, wks	lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs	lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont	lb.	.75	.85	.75	.85	.75	.85
Anhydrous	lb.	...	.75	...	.75	...	.75
Dichloride, 50 gal drs, wks	lb.	.0545	.0994	.0545	.0994	.0545	.0994
Glycol, 50 gal drs, wks	lb.	.17	.21	.17	.21	.17	.21
tks, wks	lb.	...	.16	...	.16	...	.16
Mono Butyl Ether, drs, wks	lb.	.20	.21	.20	.21	.20	.21
tks, wks	lb.	...	.19	...	.19	...	.19
Mono Ethyl Ether, drs, wks	lb.	.16	.17	.16	.17	.16	.17
tks, wks	lb.	...	.15	...	.15	...	.15
Mono Ethyl Ether Acetate, drs, wks	lb.	...	.14	...	.14	...	.14
tks, wks	lb.	...	.13	...	.13	...	.13
Mono, Methyl Ether, drs wks	lb.	.18	.22	.18	.22	.18	.22
tks, wks	lb.	...	.17	...	.17	...	.17
Oxide, cyl	lb.	.50	.55	.50	.55	.50	.55
Ethylidenaniline	lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, blk pottery	ton	17.00	19.00	17.00	19.00	...	14.50
Powd, blk, wks	ton	14.00	14.50	14.00	14.50	14.00	14.50
Ferric Chloride, tech, crys, 475 lb bbls	lb.	.05	.07½	.05	.07½	.05	.07½
sol. 42° cbys	lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Fish Scrap, dried, unground, wks	unit *l*	...	3.00	...	3.00	...	...
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis	unit *m*	...	nom.	...	...	2.75	3.15
Fluorspar, 98%, bgs	lb.	...	33.00	...	33.00	no prices	
Formaldehyde, USP, 400 lb bbls, wks	lb.	.05¾	.06¼	.05¾	.06¼	.05¾	.06¼
Fossil Flour	lb.	.02½	.04	.02½	.04	.02¼	.04
Fullers Earth, blk, mines	ton	10.00	11.00	10.00	11.00	6.50	15.00
Imo powd, c-l, bgs	ton	23.00	30.00	23.00	30.00	23.00	30.00
Furfural (tech) drs, wks	lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb drs	lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities	lb.	.12½	.14	.12½	.14	.12½	.18
Fustic, crystals, 100 lb boxes	lb.	.22	.26	.22	.26	.20	.26
Liquid 50°, 600 lb bbls	lb.	.09½	.13	.09½	.13	.08½	.13
Solid, 50 lb boxes	lb.	.17½	.19½	.17½	.19½	.16	.19½
G SALT PASTE							
G Salt paste, 360 lb bbls	lb.	.45	.47	.45	.47	.45	.47
Gall Extract	lb.	.19	.20	.19	.20	.19	.20
Gambier, com 200 lb bgs	lb.	.06¾	.07¾	.06¾	.07¾	...	nom.
Singapore cubes, 150 lb bgs	100 lb.	.10½	.11	.10½	.11	.09½	.10½
Gelatin, tech, 100 lb cs	lb.	.45	.50	.45	.50	.45	.55
Glauber's Salt, tech, c-l, bgs, wks*	100 lb.	.95	1.15	.95	1.15	.95	1.15
Anhydrous, see Sodium Sulfate.							
Glue, bone, com grades, c-l bgs	lb.	.13	.16½	.13	.16½	.11	.17½
Better grades, c-l, bgs	lb.	.14½	.16½	.14½	.16½	.12½	.17½
Casein, kgs	lb.	.18	.22	.18	.22	.18	.22

l + 10; *m* + 50; *Bbls. are 20c higher.

Current

Glycerin
Gum, Hemlock

		Current Market		1938 Low	1938 High	1937 Low	1937 High
Glycerin, CP, 550 lb drs	lb.	.15½	.16	.15½	.16	.15½	.29
Dynamite, 100 lb drs	lb.	.15½	.16	.15½	.16	.15½	.29
Saponification, drs	lb.	.10½	.11	.09½	.11¼	.11	.29
Soap Lye, drs	lb.	.09½	.10	.08½	.10¼	.10	.27
Glyceryl Bori-Borate, bbls	lb.	...	.40	...	.40	...	...
Monoricinoleate, bbls	lb.	...	.27	...	.27	...	...
Monostearate, bbls	lb.	...	.30	...	.30	...	...
Oleate, bbls	lb.	...	.22	...	.22	...	...
Phthalate	lb.	...	.37	...	.37	.29	.37
Glyceryl Stearate, bbls	lb.	...	.18	...	.18	...	.18
Glycol Bori-Borate, bbls	lb.	...	.26	...	.26	...	...
Phthalate, drs	lb.	...	.40	...	.40	.29	.40
Stearate, drs	lb.	...	.27½	...	.27½	.23	.27½

GUMS

Gum Aloes, Barbadoes	lb.	.85	.90	.85	.90	.85	.90
Arabic, amber sorts	lb.	.10¼	.10¾	.10¼	.12	.10½	.15½
White sorts, No. 1, bgs	lb.	.27	.28	.24	.28	.24	.30
No. 2, bgs	lb.	.25	.26	.22	.26	.22	.28
Powd, bbls	lb.	.13½	.14	.13½	.16	.14	.19
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b., NY	lb.	02½	.10½	.02½	.10½	.02½	.10½
California, f.o.b., NY, drs	ton	29.00	55.00	29.00	55.00	29.00	55.00
Egyptian, 200 lb cases, f.o.b., NY	lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases	lb.	.18	.20	.15	.20	.15	.25
Copal, Congo, 112 lb bgs, clean, opaque	lb.	...	.19¼	...	.19¼	.18⅞	.19¼
Dark amber	lb.	...	.08⅞	...	.08⅞	.06⅞	.09¼
Light amber	lb.	...	.12⅞	.12⅞	.13¼	.10¼	.14⅜
Copal, East India, 180 lb bgs							
Macassar pale bold	lb.	...	.12⅛	.12⅛	.13	...	.13
Chips	lb.	...	.05⅜	...	.05⅜	.05⅜	.06½
Dust	lb.	.03⅝	.04⅛	.03⅝	.04⅛	.03⅝	.04⅛
Nubs	lb.	...	.10⅜	...	.10⅜	.10⅜	.11¼
Singapore, Bold	lb.	...	.15¼	...	.15¼	.15¼	.15⅝
Chips	lb.	...	.04¾	...	.04¾	.04¼	.05
Dust	lb.	.03⅝	.04⅛	.03⅝	.04⅛	.03⅝	.04⅛
Nubs	lb.	...	.10	...	.10	.10	.10¾
Copal Manilla, 180-190 lb baskets, Loba A	lb	...	.12	...	.12	.09¾	.12
Loba B	lb.	...	.11⅝	...	.11⅝	.09¼	.11⅝
Loba C	lb	...	.10½	.10½	.11¼	.08⅞	.11¼
DBB	lb.	...	.08¾	...	.08¾	.08	.08¾
Dust	lb.	...	.06⅜	.06⅜	.06⅝	.05¾	.06⅝
MA sorts	lb.	...	.06⅜	.06⅜	.07¼	.06¾	.07¼
Copal Pontianak, 224 lb cases, bold genuine	lb.	...	.16½	...	.16½	.15½	.16½
Chips	lb.	...	.10¼	...	.10¼	.09⅛	.11⅛
Mixed	lb.	...	.14	...	.14	.13½	.14
Nubs	lb.	...	.12⅞	...	.12⅞	.12¾	.13½
Split	lb.	...	.13⅞	...	.13⅞	.13½	.15¼
Dammar Batavia, 136 lb cases							
A	lb.	...	.23¼	.23¼	.25½	.23½	.25½
B	lb.	...	.21¾	.21¾	.24	.22⅛	.24
C	lb.	...	.18⅞	.18⅞	.20⅜	.18½	.20⅜
D	lb.	...	.16⅜	.16⅜	.17½	.15¼	.17½
A/D	lb.	...	.18⅞	.18⅞	.20⅜	.17⅝	.20⅜
A/E	lb.	...	.16	.16	.17¼	.14⅞	.17¼
E	lb.	...	.08½	.08½	.08½	.07½	.08½
F	lb.	...	.07¼	...	.07¼	.06¼	.07¼
Singapore, No. 1	lb.	...	.19¼	.19¼	.21⅛	.17⅛	.21½
No. 2	lb.	...	.14½	.14½	.15⅜	.14⅛	.16¼
No. 3	lb.	...	.05¾	...	.05¾	...	.05¾
Chips	lb.	...	.13½	...	.13½	.10¼	.13½
Dust	lb.	...	.05¾	...	.05¾	.05¾	.06
Seeds	lb.	...	.09½	...	.09½	.07⅛	.09½
Elemi, cons	lb.	.09⅜	.09½	.09⅜	.09½	.09⅜	.10¼
Ester	lb.	.07¾	.08½	.07¾	.08½	.09	.12
Gamboge, pipe, cases	lb.	.70	.75	.70	.80	.58	.80
Powd, bbls	lb.	.75	.80	.75	.85	.65	.85
Ghatti, sol. bgs	lb.	.11	.15	.11	.15	.11	.15
Karaya, powd, bbls, xxx	lb.	.27	.30	.27	.30	.24	.30
xx	lb.	.18	.19	.18	.19	.16	.19
No. 1	lb.	.12	.13	.12	.13	.09½	.13
No. 2	lb.	.11	.12	.11	.12	.08½	.12
Kauri, NY, San Francisco, Brown XXX, cases	lb.	.60	.60½	.60	.60½	.60	.60½
BX	lb.	...	.38	...	.38	.33	.38
B1	lb.	...	.28	...	.28	.21	.28
B2	lb.	...	.24	...	.24	.15½	.26
B3	lb.	...	.18½	...	.18½	.12	.18½
Pale XXX	lb.	...	.61	...	.61	.61	.65½
No. 1	lb.	...	.41	...	.41	.40	.41
No. 2	lb.	...	.24	...	.24	.22	.24
No. 3	lb.	...	.17¾	...	.17¾	.15	.17¾
Kino, tins	lb.	2.50	2.75	2.00	2.75	.70	2.10
Mastic	lb.	.55	.56	.55	.56	.55	.58
Sandarac, prime quality, 200 lb bgs & 300 lb cks	lb.	.25	.26	.25	.26	.25	.35
Senegal, picked bags	lb.	.25	.27	.23	.27	.20	.29
Sorts	lb.	.10½	.11	.10½	.12	.09¾	.15
Thus, bbls	280 lbs.	13.50	14.00	13.50	14.00	12.00	14.00
Strained	280 lbs.	...	14.00	...	14.00	12.00	14.00
Tragacanth, No. 1, cases	lb.	2.75	3.00	2.75	3.00	2.40	3.25
No. 2	lb.	2.40	2.75	2.40	2.75	2.00	2.75
No. 3	lb.	2.35	2.70	2.35	2.70	1.95	2.70
No. 4	lb.	2.30	2.65	2.30	2.65	1.85	2.65
No. 5	lb.	2.25	2.50	2.25	2.50	1.65	2.50
Yacca, bgs	lb.	.03½	.04½	.03½	.04½	.03¼	.04½
Helium, cyl (200 cu. ft.)	cyl.	...	25.00	...	25.00	...	25.00
Hematine crystals, 400 lb bbls	lb.	.18	.34	.18	.34	.16	.34
Hemlock, 25%, 600 lb bbls, wks	lb.	.03	.03¼	.03	.03¼	.03	.03¼
tks	lb.	...	.02¾	...	.02¾	...	.02¾

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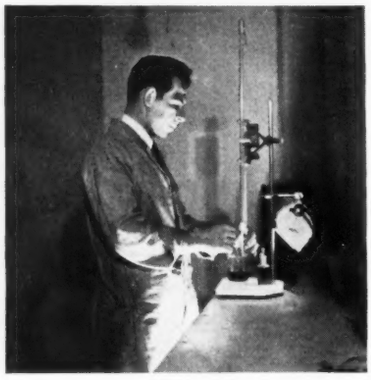

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Prices

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Hexalene, 50 gal drs, wks	lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70° C. Group 3, tks	gal.	...	.10½	...	.10½	...	.10½
Hexamethylenetetramine, powd, drs	lb.	.35	.36	.35	.36	.35	.36
Hexyl Acetate, secondary, delv, drs	lb.	.13	.13½	.13	.13½	.13	.13½
tks	lb.	...	.12	...	.12	...	.12
Hoof Meal, f.o.b. Chicago unit		...	3.00	3.00	3.35	3.20	3.75
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb.	.19½	.20	.19½	.20	.20	.21
Hydroxylamine Hydrochloride	lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls	lb.	.16	.21	.16	.21	.15	.21
INDIGO							
Indigo, Bengal, bbls	lb.	...	2.40	...	2.40	...	2.40
Synthetic, liquid	lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, kgs	lb.	1.50	1.60	1.50	1.60	1.50	1.60
Irish Moss, ord, bales	lb.	.10	.11	.10	.11	.11	.12
Bleached, prime, bales	lb.	.19	.20	.19	.20	.19	.21
Iron Acetate Liq. 17°, bbls, delv	lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.							
Nitrate, coml, bbls 100 lb.	lb.	2.32	3.11	2.32	3.11	2.32	3.25
Isobutyl Carbinol (128-132° C) drs, wks	lb.	.33	.34	.33	.34	.33	.34
tks, wks	lb.	...	.32	...	.32	...	.32
Isopropyl Acetate, tks, frt all'd	lb.	...	.05½	...	.05½	.05½	.06½
drs, frt all'd	lb.	.06½	.07	.06½	.07	.06½	.08
Ether, see Ether, isopropyl.							
Keiselguhr, dom bags, c-l, Pacific Coast	ton	22.00	85.00	22.00	85.00	22.00	85.00
LEAD ACETATE							
Lead Acetate, f.o.b. NY, bbls, White, broken	lb.	...	.11	...	.11	.11	.13½
cryst, bbls	lb.	...	.11	...	.11	.11	.13½
gran, bbls	lb.	...	.11¾	...	.11¾	.11¾	.14¼
powd, bbls	lb.	...	.11¾	...	.11¾	.11¾	.14¼
Arsenate, East, drs	lb.	.12½	.13	.12½	.13½	.11	.13½
Linoleate, solid, bbls	lb.	...	.19	.	.19	.18	.19
Metal, c-l, NY 100 lb.		...	4.50	4.50	4.90	4.75	7.05
Nitrate, 500 lb bbls, wks	lb.	.11	.11½	.11	.11½	.09	.11¼
Oleate, bbls	lb.	.18½	.20	.18½	.20	.15	.20
Red, dry, 95% Pb_2O_4, delv	lb.	...	.07	.07	.074	.07¼	.0945
97% Pb_2O_4, delv	lb.	...	.07¼	.07¼	.0765	.07½	.09¾
98% Pb_2O_4, delv	lb.	...	.07½	.07½	.0790	.07¾	.10
Resinate, precip, bbls	lb.	...	.16½	.	.16½	.14	.16½
Stearate, bbls	lb.	.22	.23	.22	.23	.22	.23
Titanate, bbls, c-l, f.o.b. wks, frt all'd	lb.	.11	.11½	.11	.11½	.10	.12
White, 500 lb bbls, wks	lb.	...	.06¼	.06¼	.06¾	.06¾	.09
Basic sulfate, 500 lb bbls, wks	lb.	...	.05¾	.05¾	.06¼	.06¼	.08¾
Lime, chemical quicklime, f.o.b., wks, bulk	ton	7.00	8.00	7.00	8.00	6 00	8.00
Hydrated, f.o.b., wks	ton	8.50	12.00	8.50	12.00	8.00	12.00
Lime Salts, see Calcium Salts.							
Lime sulfur, dealers, tks	gal.	.08	.11½	.08	.11½	.	.11
drs	gal.	.11	.16	.11	.16	.13	.16
Linseed Meal, bgs	ton	...	39.00	39.00	45.00	35.00	42.50
Litharge, coml, delv, bbls	lb.	...	.06	.06	.064	.06¼	.08½
Lithopone, dom, ordinary, delv, bgs	lb.	.04⅜	.04⅝	.04⅜	.04⅝	.04¼	.04⅝
bbls	lb.	.04⅝	.04⅞	.04⅝	.04⅞	.04½	.04⅞
High strength, bgs	lb.	.05⅞	.06⅛	.05⅞	.06⅛	.05¾	.06⅛
bbls	lb.	.06⅛	.06⅜	.06⅛	.06⅜	.06	.06⅜
Titanated, bgs	lb.	.05⅞	.06⅛	.05⅞	.06⅛	.05¾	.06⅛
bbls	lb.	.06⅛	.06⅜	.06⅛	.06⅜	.06	.06⅜
Logwood, 51°, 600 lb bbls	lb.	.09½	.11½	.09½	.11½	.08½	.11½
Solid, 50 lb boxes	lb.	.15	.19	.15	.19	.15	.17½
Sticks	ton	24.00	25.00	24.00	25.00	24.00	25.00
MADDER							
Madder, Dutch	lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl	ton	60.00	65.00	60.00	65.00	60.00	65.00
Magnesium Carb, tech, 70 lb bgs, wks	lb.	.05¾	.06½	.05¾	.07	.06	.07
Chloride flake, 375 lb drs, c-l, wks	ton	39.00	42.00	39.00	42.00	39.00	42.00
Fluosilicate, crys, 400 lb bbls, wks	lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, calc tech. heavy bbls, frt all'd	lb.	.25	.30	.25½	.30½	...	...
Light, bbls, above basis	lb.	.20	.25	.20	.25½	...	...
USP Heavy, bbls, above basis	lb.	.25	.30	.25	.30½	...	...
Palmitate, bbls	lb.	.33	nom.	.	.33	.33	nom.
Silicofluoride, bbls	lb.	.09½	.10½	.09½	.10½	.09½	.10½
Stearate, bbls	lb.	.21	.24	.21	.24	.21	.24
Manganese acetate, drs	lb.	...	.26½	...	.26½	.25½	.26½
Borate, 30%, 200 lb bbls	lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb cks	lb.	.09	.12	.09	.12	.09	.12
Dioxide, tech (peroxide), paper bgs, c-l	ton	...	62.50	...	62.50	47.50	62.50
Hydrate, bbls	lb.	...	.32	...	.32	...	.32
Linoleate, liq, drs	lb.	.18	.19¼	.18	.19¼	.18	.19¼
solid, precip, bbls	lb.	...	.19	.	.19	.17½	.19
Resinate, fused, bbls	lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs	lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs	lb.	.07	.07½	.07	.07½	.07	.07½

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Mangrove, 55%, 400 lb bbls	lb.	04	...	.04	...	.04
Bark, African	ton	25.00	25.00	25.50	25.00	27.00
Mannitol, pure cryst, cs, wks	lb.	1.40	1.40	1.45	1.45	1.48
Marble Flour, blk	ton	12.00	12.00	13.00	12.00	13.00
Mercury chloride (Calomel)	lb.	1.18	1.18	1.59	1.05	1.60
Mercury metal	76 lb. flasks	72.00	73.00	79.00	81.00	99.00
Meta-nitro-aniline	lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls	lb.	1.45	1.55	1.45	1.55	1.45	1.55
Meta-phenylene diamine 300 lb bbls	lb.	.80	.84	.80	.84	.80	.84
Meta-toluene-diamine, 300 lb bbls	lb.	.65	.67	.65	.67	.65	.67
Methanol, denat, grd, drs, c-l, frt all'd	gal.	...	.34	.34	.36	.36	.53
tks, frt all'd	gal.	...	.28	.28	.30	.30	.48
Pure, drs, c-l, frt all'd	gal.	...	.38	...	.38	..	.38
tks	gal.	...	.33	...	.33	...	.33
95%, tks	gal.	...	.31	...	.31	...	.31
97%, tks	gal.	...	.32	...	.32	...	.32
Methyl Acetate, tech, tks, delv	lb.	...	.06½	...	.06½	...	...
55 gal drs, delv	lb.	.07½	.08	.07½	.08	...	...
C.P. 97-99%, tks, delv	lb.	...	.07	...	.07	...	...
55 gal drs, delv	lb.	.08	.08½	.08	.08½	...	...
Acetone, frt all'd, drs	gal. *p*	.31½	.37½	.31½	.40½	.34½	.58½
tks, frt all'd, drs	gal. *p*	.26½	.30½	.26½	.32½	.28½	.44½
Synthetic, frt all'd, east of Rocky M., drs	gal. *p*	.42	.51	.42	.51	.42	.59½
tks, frt all'd	gal.	.36	.39½	.36	.39½	.36	.49½
West of Rocky M., frt all'd, drs	gal. *p*	...	.46	...	.46	.46	.58
tks, frt all'd	gal. *p*	...	.39½	...	.39½	.39½	.51
Anthraquinone	lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tks	lb.	...	.10½	...	.10½	...	.10½
Chloride, 90 lb cyl	lb.	.32	.40	.32	.40	.32	.43
Ethyl Ketone, tks, frt all'd	lb.	...	.05½	.05½	.06	...	.07½
50 gal drs, frt all'd c-l	lb.	...	.06½	.06½	.07	...	...
Formate, drs, frt all'd	lb.	.35	.36	.35	.36	.35	.39
Hexyl Ketone, pure, drs	lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd	lb.	...	.30	...	.30	...	.30
Propyl carbinol, drs	lb.	.60	.75	.60	.75	.60	.75
Mica, dry grd, bgs, wks	lb.	...	35.00	...	35.00	...	35.00
Michler's Ketone, kgs	lb.	...	2.50	...	2.50	...	2.50
Molasses, blacksrap, tks, f.o.b. NY	gal.	...	.07	...	.07	.07	.07¼
Monoamylamine, c-l, drs, wks	lb.	.52	1.00	.52	1.00	.52	1.00
Monobutylamine, lcl, drs, wks	lb.	...	.65	...	.65	...	...
Monochlorobenzene, see Chlorobenzene, mono.							
Monoethanolamine, tks, wks	lb.	...	.23	...	.23	.25	.30
Monomethylamine, drs, frt all'd, E. Mississippi, c-l	lb.	...	.65	...	.65	...	.65
Monomethylparaminosulfate, 100 lb drs	lb.	3.75	4.00	3.75	4.00	3.75	4.00
Myrobalans 25%, liq bbls	lb.	...	.04¼	...	.04¼	...	.04¼
50% Solid, 50 lb boxes	lb.	.06	.06¼	.06	.06¼	.06	.06¼
J1 bgs	ton	...	28.50	28.00	30.00	26.50	30.00
J2 bgs	ton	...	21.00	21.00	22.00	19.00	22.50
R2 bgs	ton	...	20.50	20.50	22.00	18.75	22.00

NAPHTHA

Naphtha, v.m.&p. (deodorized) see petroleum solvents.							
Naphtha, Solvent, water-white, tks	gal.	...	.31	...	.31	...	.31
drs, c-l	gal.	...	.36	...	.36	...	.36

NAPHTHALENE

Naphthalene, dom, crude, bgs, wks	lb.	2.35	2.70	2.35	2.70	2.00	3.00
Imported, cif, bgs	lb.	2.20	2.25	2.20	2.25	2.20	3.00
Balls, flakes, pks	lb.	...	.07	.07	.08	...	.08
Balls, ref'd, bbls, wks	lb.	...	.06¾	.06¾	.07¼	...	.07¼
Flakes, ref'd, bbls, wks	lb.	...	.06¾	.06¾	.07¼	...	.07¼
Nickel Carbonate, bbls	lb.	.36	.37½	.36	.37½	.36	.37½
Chloride, bbls	lb.	.18	.20	.18	.20	.18	.20
Metal ingot	lb.	...	.35	...	.35	...	.35
Oxide, 100 lb kgs, NY	lb.	.35	.37	.35	.37	.35	.37
Salt, 400 lb bbls, NY	lb.	.13	.13½	.13	.13½	.13	.13½
Single, 400 lb bbls, NY	lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, 40%, drs, sulfate, 55 lb drs	lb.	...	.76	...	.76	...	.76
Nitre Cake, blk	ton	...	16.00	...	16.00	...	16.00
Nitrobenzene, redistilled, 1000 lb drs, wks	lb.	.08	.10	.08	.10	.08	.10
tks	lb.	...	.07½	...	.07½	...	.07½
Nitrocellulose, c-l, l-c-l, wks	lb.	.22	.29	.22	.29	.26	29
Nitrogenous Mat'l, bgs, imp	unit	...	2.50	2.50	2.65	2.55	3.55
dom, Eastern wks	unit	...	2.75	2.50	2.75	2.50	4.25
dom, Western wks	unit	...	2.35	2.20	2.35	2.25	3.75
Nitronaphthalene, 550 lb bbls	lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs	lb.	no prices				.20	.22
Chinese, bgs	lb.	no prices				.20	.22

OAK BARK

Oak Bark Extract, 25%, bbls	lb.	...	.03⅛	...	.03⅛	...	.03⅛
tks	lb.	...	.02¾	...	.02¾	...	.02¾
Octyl Acetate, tks, wks	lb.	.16	.17	.16	.17	.16	.17

o Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila. or N. Y.

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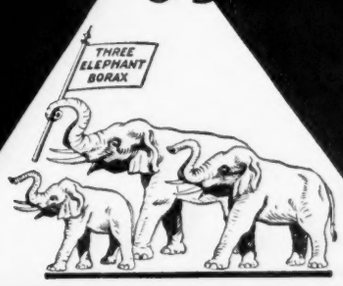

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Orange-Mineral Phenylhydrazine Hydrochloride

Prices

		Current Market	1938 Low	1938 High	1937 Low	1937 High
Orange-Mineral, 1100 lb cks NY	lb.	...	.10	.10	.10¼	.12¾
Orthoaminophenol, 50lb kgs	lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs	lb.	.70	.74	.70	.74	.70	.74
Orthochlorophenol, drs	lb.	.35	.75	.35	.75	.35	.75
Orthocresol, drs, wks	lb.	.13½	.14½	.13½	.14½	.13½	.14½
Orthodichlorobenzene, 1000 lb drs	lb.	.06	.07	.06	.07	.05	.07
Orthonitrochlorobenzene, 1200 lb drs, wks	lb.	.15	.18	15	.18	.28	.29
Orthonitroparachlorphenol, tins	lb.	...	.75	...	.75	.70	.75
Orthonitrophenol, 350 lb drs	lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks	lb.	.08	.10	.08	.10	.07	.10
Orthotoluidine, 350 lb bbls, l-c-l	lb.	.16	.17	.16	.17	.14	.17
Osage Orange, cryst, bbls	lb.	.17	.25	.17	.25	.17	.25
51° liquid	lb.	.07	.08	.07	.08	.07	.08
Paraffin, rfd, 200 lb cs slabs 122-127° M P	lb.	.043	.0435	.043	.04½	.0445	.04½
128 132° M P	lb.	.0445	.0455	.0445	.049	.043¾	.049
133-137° M P	lb.	.05	.05¼	.05	.05¾	.05½	.05¾
Para aldehyde, 99%, tech, 110-55 gal drs, delv	lb.	...	.16	.16	.18	.16	.18
Aminoacetanilid, 100 lb kgs	lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs	lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs	lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs	lb.	.30	.45	.30	.45	.30	.45
Dichlorobenzene, 200 lb drs, wks	lb.	.11	.12	.11	.12	.11	.20
Formaldehyde, drs, wks	lb.	.34	.35	.34	.35	.34	.35
Nitroacetanilid, 300 lb bbls	lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks	lb.	.45	.47	.45	.47	.45	.47
Nitrochlorobenzene, 1200 lb drs, wks	lb.	.15	.16	.15	.16	.23½	.24
Nitro-orthotoluidine, 300 lb bbls	lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls	lb.	.35	.37	.35	.37	.35	.37
Nitrosodimethylaniline, 120 lb bbls	lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls	lb.	...	.35	...	.35	...	.35
Phenylenediamine, 350 lb bbls	lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb bbls	lb.	.70	.75	.70	.75	.70	.75
tks, wks	lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks	lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks	lb.	.56	.58	.56	.58	.56	.58
Paris Green, dealers, drs	lb.	.23	.26	.23	.26½	.22	.26½
Pentane, normal, 28-38° C. group 3, tks	gal.	...	.08½	...	.08½	.08½	.09½
drs, group 3	gal.	.12½	.16	.12½	.16	.12½	.16
Perchlorethylene, 100 lb drs, frt all'd	lb.	...	.10½	...	.10½	...	.10½
Petrolatum, dark amber, bbls	lb.	.02¾	.03⅞	.02¾	.03⅞	.02⅝	.03
Light, bbls	lb.	.03⅛	.03⅜	.03⅛	.03⅜	.03⅛	.03⅜
Medium, bbls	lb.	.02⅞	.03⅛	.02⅞	.03⅛	.02⅞	.03⅛
Dark green, bbls	lb.	.02½	.02¾	.02½	.02¾	.02½	.02¾
Red, bbls	lb.	.02½	.03⅝	.02½	.03⅝	.02⅛	.03¼
White, lily, bbls	lb.	.05½	.07⅛	.05½	.07⅛	.06	.06¼
White, snow, bbls	lb.	.06½	.08⅛	.06½	.08⅛	.07	.07¼
Petroleum Ether, 30-60°, group 3, tks	gal.	...	.13	...	.13	...	.13
drs, group 3	gal.	.14	.17	.14	.17	.15	.17

PETROLEUM SOLVENTS AND DILUENTS

Cleaners naphthas, group 3, tks, wks	gal.	...	.06⅜	.06⅜	.07⅜	.06⅞	.07⅞
East Coast, tks, wks	gal.	...	.10	...	.10	.09½	10
Hydrogenated, naphthas, frt all'd East, tks	gal.	...	.16	...	.16	...	.16
No. 2, tks	gal.	...	.18	...	.18	...	.18
No. 3, tks	gal.	...	.16	...	.16	...	.16
No. 4, tks	gal.	...	.18	...	.18	...	.18
Lacquer diluents, tks, Bayonne	gal.	.12	.12½	.12	.12½	.12	.12½
Group 3, tks	gal.	...	.07⅜	.07⅜	.08⅜	.07⅞	.08⅞
Naphtha, V.M.P., East, tks, wks	gal.	...	.10	.10	.11	.10	.11
Group 3, tks, wks	gal.	...	.06⅜	.06⅜	.07⅜	.06⅞	.07⅞
Petroleum thinner, 43-47, East, tks, wks	gal.	...	.09½	...	.09½	.09	.10
Group 3, tks, wks	gal.	...	.05⅜	.05⅜	.06⅜	.05⅞	.06⅞
Rubber Solvents, stand grd, East, tks, wks	gal.	.09½	.10	.09½	.10	.09½	.10
Group 3, tks, wks	gal.	...	.06⅜	.06⅜	.07⅜	.06⅞	.07⅞
Stoddard Solvent, East, tks, wks	gal.	...	.10	...	.10	.09½	.10
Group 3, tks, wks	gal.	...	.05⅞	.05⅞	.06⅞	.06⅜	.07⅜
Phenol, 250-100 lb drs	lb.	.14½	.15½	.14½	.15½	.13¾	.15½
tks, wks	lb.	...	.13½	...	.13½	.12¾	.13½
Phenyl-Alpha-Naphthylamine, 100 lb kgs	lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs	lb.	...	.17	...	.17	.16	.17
Phenylhydrazine Hydrochloride, com	lb.	...	1.50	...	1.50	...	1.50

		Current Market		1938 Low	1938 High	1937 Low	1937 High
Phloroglucinol, tech, tins	lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tins	lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines							
Florida Pebble, 68% basis	ton	...	1.85	...	1.85	...	1.85
70% basis	ton	...	2.35	...	2.35	...	2.35
72% basis	ton	...	2.85	...	2.85	...	2.85
75-74% basis	ton	...	3.85	...	3.85	...	3.85
75% basis	ton	...	5.50	...	5.50	...	5.50
Tennessee, 72% basis	ton	...	4.50	...	4.50	...	4.50
Phosphorus Oxychloride 175 lb cyl	lb.	.16	.20	.16	.20	.16	.20
Red, 110 lb cases	lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs	lb.	.38	.44	.38	.44	.38	.44
Trichloride, cyl	lb.	.15	.18	.15	.18	.15	.20
Yellow, 110 lb cs, wks	lb.	.24	.30	.24	.30	.24	.33
Phthalic Anhydride, 100 lb drs, wks	lb.	...	.14½	...	.14½	.14½	.15½
Pine Oil, 55 gal drs or bbls							
Destructive dist	lb.	.52	.55	.52	.55	.49	.65
Steam dist wat wh bbls	gal.	...	.59	...	.59	.59	.79
tks	gal.	...	.54	...	.54	.54	.74
Pitch Hardwood, wks	ton	18.25	18.75	18.25	18.75	15.00	18.75
Coaltar, bbls, wks	ton	...	19.00	...	19.00	...	19.00
Burgundy, dom, bbls, wks	lb.	.05½	.06½	.05½	.06½	.03½	.06½
Imported	lb.	.15	.16	.15	.16	.11	.16
Petroleum, see Asphaltum in Gums' Section.							
Pine, bbls	bbl.	6.00	6.25	5.75	6.25	5.75	6.50
Stearin, drs	lb.	.03	.04½	.03	.04½	.03	.04½
Platinum, ref'd	oz.	34.00	36.00	32.00	38.00	32.00	68.00
POTASH							
Potash, Caustic, wks, sol	lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
flake	lb.	.07	.07⅜	.07	.07⅜	.07	.07⅜
Liquid, tks	lb.	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, imported 30% basis, blk	unit	...	.58½	...	.58½	.55	.58½
Potassium Abietate, bbls	lb.	...	.13	...	.13	...	...
Acetate, tech, bbls, delv	lb.	...	.26	.26	.28	.26	.28
Bicarbonate, USP, 320 lb bbls	lb.	...	.18	...	.18	.09	.18
Bichromate Crystals, 725 lb cks*	lb.	.08¾	.09¼	.08¾	.09¼	.08¾	.09
Binoxalate, 300 lb bbls	lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs	lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks	lb.	.06½	.07	.06½	.07	.06½	.07
liquid, tks	lb.	...	.02⅞	...	.02⅞	.02¾	.02⅞
drs, wks	lb.	.03	.03½	.03	.03½	.02⅞	.03½
Chlorate crys, 112 lb kgs, wks	lb.	.09¼	.09½	.09¼	.09½	.09¼	.09½
gran, kgs	lb.	.12	.13	.12	.13	.12	.13
powd, kgs	lb.	.08½	.08¾	.08½	.08¾	.08½	.08¾
Chloride, crys, bbls	lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kgs	lb.	.19	.28	.19	.28	.28	.29
Cyanide, 110 lb cases	lb.	.55	.57½	.55	.57½	.55	.57½
Iodide, 75 lb bbls	lb.	.93	1.00	.93	1.00	.93	1.15
Metabisulfite, 300 lb bbls	lb.	.13	.15	.13	.15	.11	.15
Muriate, bgs, dom, blk	unit	...	.53½	...	.53½	.50	.53½
Oxalate, bbls	lb.	.25	.26	.25	.26	.25	.26
Perchlorate, kgs, wks	lb.	.09½	.11½	.09½	.11½	.09½	.11
Permanganate, USP, crys, 500 & 1000 lb drs, wks	lb.	.18½	.19½	.18½	.19½	.18½	.19½
Prussiate, red, bbls	lb.	.35	.37	.35	.37	.35	.37
Yellow, bbls	lb.	.15	.16	.15	.16	.15	.18
Sulfate, 90% basis, bgs	ton	...	38.00	...	38.00	...	36.25
Titanium Oxalate, 200 lb bbls	lb.	.35	.40	.35	.40	.33	.40
Pot & Mag Sulfate, 48% basis bgs	ton	...	25.75	...	25.75	24.75	25.75
Propane, group 3, tks	lb.	.03	.04⅜	.03	.04⅜	.03	.04⅜
Putty, coml, tubs	100 lb.	...	2.25	2.25	2.90	2.90	3.00
Linseed Oil, kgs	100 lb.	...	4.00	4.00	4.65	4.65	4.75
Pyrethrum, conc liq: 2.4% pyrethrins, drs, frt all'd	gal.	6.40	6.75	5.00	6.75	4.15	5.25
3.6% pyrethrins, drs, frt all'd	gal.	9.60	9.95	7.65	9.95	6.10	7.85
Flowers, coarse, Japan, bgs	lb.	...	.23¾	.18	.23¾	.12¾	.18
Fine powd, bbls	lb.	...	.25¼	.19	.25¼	.14	.19
Pyridine, denat, 50 gal drs	gal.	...	1.55	...	1.55	1.30	1.55
Refined, drs	lb.	...	.45	...	.45	...	...
Pyrites, Spanish cif Atlantic ports, blk	unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins	lb.	2.15	2.75	2.15	2.75	2.15	2.75
Quebracho, 35% liq tks	lb.	...	.03	...	.03	.02⅞	.03
450 lb bbls, c-l	lb.	...	.03½	...	.03½	.03½	.03⅞
Solid, 63%, 100 lb bales cif	lb.	...	.04	...	.04	.03⅞	.04
Clarified, 64%, bales	lb.	...	.04¼	...	.04¼	.04¼	.04⅜
Quercitron, 51 deg liq, 450 lb bbls	lb.	.06	.06½	.06	.06½	.06	.06½
Solid, drs	lb.	.10	.12	.10	.12	.10	.12
R SALT							
R Salt, 250 lb bbls, wks	lb.	.52	.55	.52	.55	.52	.55
Resorcinol tech, cans	lb.	.75	.80	.75	.80	.75	.80
Rochelle Salt, cryst	lb.	.16½	.17½	.15	.17½	.14½	.15½
Powd, bbls	lb.	.17½	.18½	.16	.18½	.13½	.16½
Rosin Oil, bbls, first run	gal.	...	.55	.52	.60	.52	.73
Second run	gal.	...	.57	.54	.62	.54	.75
Third run, drs	gal.	...	.61	.58	.66	.58	.79

* Spot price is ½c higher.

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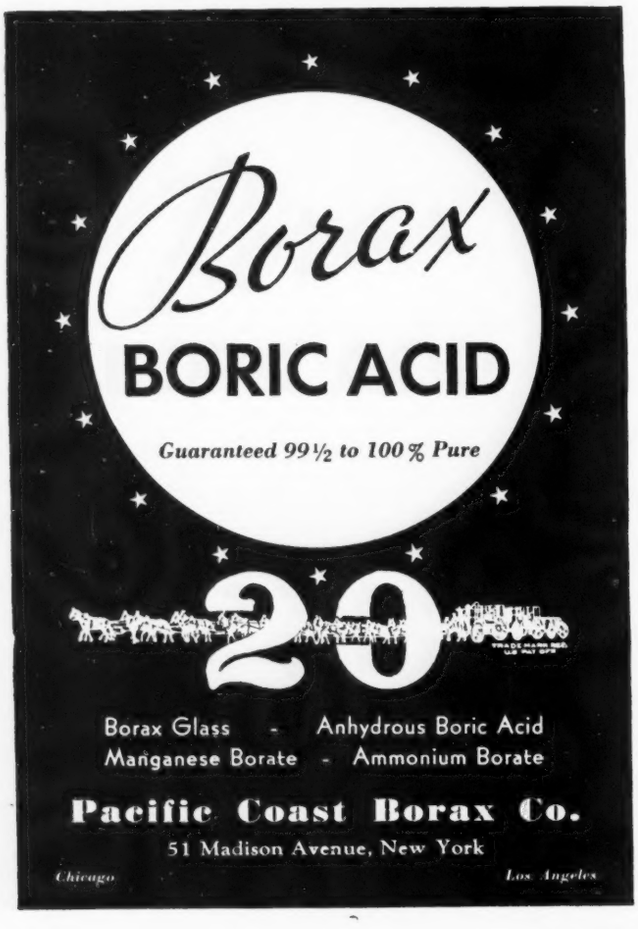

Rosins
Sodium Naphthionate

Prices

	Current Market	1938 Low	1938 High	1937 Low	1937 High
Rosins 600 lb bbls, 280 lb unit ex. yard NY:†					
B	4.90	4.90	6.00	5.50	10.00
D	5.15	5.15	6.00	5.50	10.35
E	5.20	5.15	6.00	5.75	10.25
F	6.10	5.80	7.00	6.87½	10.80
G	6.20	5.90	7.05	6.87½	10.85
H	6.20	6.00	7.15	6.90	10.85
I	6.20	6.10	7.15	6.95	10.90
K	6.20	6.15	7.25	6.95	10.90
M	6.20	6.20	7.40	7.05	11.00
N	6.60	6.40	7.50	7.10	11.05
WG	7.25	7.25	8.45	7.65	11.75
WW	7.90	7.90	9.15	8.00	13.75
Rosins, Gum, Savannah (280 lb unit):†					
B	3.50	3.50	4.60	4.25	8.75
D	3.75	3.75	4.60	4.25	9.00
E	3.80	3.75	4.60	4.25	9.10
F	4.70	4.40	5.60	5.50	9.55
G	4.80	4.50	5.65	5.60	9.60
H	4.80	4.60	5.75	5.70	9.60
I	4.80	4.70	5.85	5.70	9.65
K	4.80	4.75	6.00	5.70	9.65
M	4.80	4.80	6.15	5.80	9.75
N	5.20	5.00	6.20	5.85	9.75
WG	5.85	5.85	7.05	6.40	10.50
WW	6.50	6.50	7.75	6.75	12.50
X	6.50	6.50	7.75	6.75	12.50
Rosin, Wood, c-l, FF grade, NY	5.40	5.40	6.40	6.40	10.72
Rotten Stone, bgs mines ..ton	35.00	...	35.00	...	35.00
Imported, lump, bbls ...lb.	.12	...	.12	...	...
Powdered, bbls .....lb.	.08½ .10	.08½	.10	...	...

SAGO FLOUR

Sago Flour, 150 lb bgs ...lb.	.02¾	.03½	.02¾	.03¾	.02¾	.03¾
Sal Soda, bbls, wks ...100 lb.	...	1.20	...	1.20	1.15	1.20
Salt Cake, 94-96%, c-l, wks ton	19.00	23.00	19.00	23.00	19.00	23.00
Chrome, c-l, wks .....ton	11.00	12.00	11.00	12.00	11.00	12.00
Saltpetre, gran, 450-500 lb bbls .....lb.	.06½	.069	.06½	.069	.06	.069
Cryst, bbls .....lb.	.07½	.0865	.07½	.0865	.07	.0865
Powd, bbls .....lb.	.07¼	.079	.07½	.079	.07	.079
Satin, White, pulp, 550 lb bbls .....lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs .....lb.	.46	.48	.46	.48	.46	.48
Shellac, Bone dry, bbls ..lb. *r*	.16½	.17	.16½	.17½	.17	.22
Garnet, bgs .....lb.	.13½	.14	.13½	.15	.14	.17
Superfine, bgs .....lb. *s*	.11½	.12	.11½	.13½	.13	.18½
T. N., bgs .....lb. *s*	.11	.11½	.11	.12½	.12	.14½
Silver Nitrate, vials .....oz.	...	.31½	.31½	.34⅞	.32½	.35½
Slate Flour, bgs, wks ....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks .....100 lb.	...	1.10	...	1.10	...	1.10
58% light, bgs .....100 lb.	...	1.08	...	1.08	...	1.08
blk .....100 lb.	...	.90	...	.90	...	.90
paper bgs .....100 lb.	...	1.05	...	1.05	...	1.05
bbls .....100 lb.	...	1.35	...	1.35	...	1.35
Caustic, 76% grnd & flake, drs .....100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs .....100 lb.	...	2.30	...	2.30	...	2.30
Liquid sellers, tks ...100 lb.	...	1.97½	...	1.97½	...	1.97½
Sodium Abietate, drs .....lb.	...	.13	...	.13	.08	.13
Acetate, 60% tech, gran, powd, flake, 450 lb bbls, wks .....lb.	.04¼	.05	.04¼	.05	.04¼	.05
anhyd, drs, delv .....lb.	...	.08¼	...	.08¼	...	...
Alignate, drs .....lb.	...	.69	...	.69	.64	.69
Antimoniate, bbls .....lb.	.12⅞	.13¼	.12⅞	.15¼	.13¾	.16¼
Arsenate, drs .....lb.	.08	.08½	.08	.08½	.08	.11½
Arsenite, liq, drs .....gal.	.30	.33	.30	.33	.33	.40
Dry, gray, drs, wks ..lb.	.07½	.09½	.07½	.09½	...	...
Benzoate, USP, kgs ...lb.	.46	.48	.46	.48	.46	.48
Bicarb, powd, 400 lb bbl, wks .....100 lb.	...	1.85	...	1.85	1.75	1.85
Bichromate, 500 lb cks, wks* .....lb.	.06¾	.07¼	.06¾	.07¼	.06½	.07¼
Bisulfite, 500 lb bbl, wks lb.	.03¼	.036	.03¼	.036	.03¼	.036
35-40% sol bbls, wks 100 lb.	1.40	1.80	1.40	1.80	...	...
Chlorate, bgs, wks ...lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
Cyanide, 96-98%, 100 & 250 lb drs, wks .....lb.	.16½	.17½	.16½	.17½	.15½	.17½
Diacetate, 33-35% acid, bbls, lcl, delv .....lb.	...	.09	...	.09	...	...
Fluoride, white 90%, 300 lb bbls, wks .....lb.	.07½	.08¼	.07½	.08¼	.07½	.08¼
Hydrosulfite, 200 lb bbls, f.o.b. wks .....lb.	.16	.17	.16	.17	.16	.17
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	...	2.80	2.50	2.80	2.50	3.00
Tech, reg cryst, 375 lb bbls, wks .....100 lb.	2.45	2.80	2.40	2.80	2.40	2.75
Iodide .....lb.	1.90	1.95	1.90	1.95	1.90	1.95
Metal, drs, 280 lbs. .....lb.	...	.19	...	.19	...	.19
Metanilate, 150 lb bbls lb.	.41	.42	.41	.42	.41	.42
Metasilicate, gran, c-l, wks .....100 lb.	...	2.20	2.15	2.20	...	2.15
cryst, bbls, c-l, wks 100 lb.	...	2.90	2.75	2.90	...	2.75
Monohydrate, bbls .....lb.	...	.023	...	.023	...	.023
Naphthenate, drs .....lb.	.12	.19	.12	.19	.09	.19
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.52	.54

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; **Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case;** *s* T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; **Pacific Coast 3c; Philadelphia f.o.b. N. Y.** * Spot price is ⅛c higher; † Closing prices Nov. 26th.

Current

	Current Market	1938 Low	1938 High	1937 Low	1937 High
Sodium (continued):					
Nitrate, 92%, crude, 200 lb bgs, c-l, NY ton	... 28.30	... 28.30	26.80	28.30	
100 lb bgs ton	... 29.00	... 29.00	27.50	29.00	
Bulk ton	... 27.00	... 27.00	25.50	27.00	
Nitrite, 500 lb bbls lb.	.06¾ .11½	.06¾	.11½	.07	.10
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25 .27	.25	.27	.25	.27
Perborate, drs, 400 lbs lb.	.14¾ .15¼	.14¾	.15¼	.14¾	.15¼
Peroxide, bbls, 400 lb lb.	... .17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	... 2.05	...	2.05	1.90	2.05
bgs, wks 100 lb.	... 1.85	...	1.85	1.70	1.85
Tri-sodium, tech, 325 lb bbls, wks 100 lb.	... 2.20	...	2.20	2.05	2.20
bgs, wks 100 lb.	... 2.00	...	2.00	1.85	2.00
Picramate, 160 lb kgs lb.	.65 .67	.65	.67	.65	.67
Prussiate, Yellow, 350 lb bbl. wks lb.	.10 .11½	.10	.11½	.10	.11½
Pyrophosphate, anhyd, 100 lb bbls lb.	... .10	...	.10	...	.10
Sesquisilicate, drs, c-l, wks 100 lb.	... 3.00	...	3.00	...	...
Silicate, 60°, 55 gal drs, wks 100 lb.	1.65 1.70	1.65	1.70	1.65	1.70
40°, 35 gal drs, wks 100 lb.	... .80	...	.80	...	.80
tks, wks 100 lb.	... .65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY lb.	.05¾ .06	.05¾	.06½	.05¾	.07
Stannate, 100 lb drs lb.	.26½ .29½	.26½	.32	.28	.44
Stearate, bbls lb.	... .24	...	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16 .18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bgs* c-l, wks 100 lb. †	1.45 1.90	1.45	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb bbls, wks lb.	... .02¼	...	.02¼	...	.02¼
Solid, 650 lb drs, c-l, wks lb.	... .03	...	.03	...	.02
Sulfite, cryst, 400 lb bbls, wks lb.	.023 .02½	.023	.02½	.023	.02½
Sulfocyanide, drs lb.	.28 .47	.28	.47	.28	.47
Sulforicinoleate, bbls lb.	... .12	...	.12	...	.12
Tungstate, tech, crys, kgs lb.	... nom.	...	...	.85	.90
Sorbitol, com, solut., wks, c-l drs, wks lb.	... .18	.18	.19	...	.25
Spruce Extract, ord, tks lb.	... .01⅛	...	.01⅛	.01	.01⅛
Ordinary, bbls lb.	... .01⅝	...	.01⅝	.01½	.01⅝
Super spruce ext, tks lb.	... .01⅜	...	.01⅜	.01⅜	.01⅝
Super spruce ext, bbls lb.	... .01⅞	...	.01⅞	...	.01⅞
Super spruce ext, powd, bgs lb.	... .04	...	.04	.04	.04¼
Starch, Pearl, 140 lb bgs 100 lb.	2.88 3.08	2.88	3.18	2.93	4.53
Powd, 140 lb bgs 100 lb.	2.98 3.18	2.98	3.28	3.03	4.63
Potato, 200 lb bgs lb.	.03½ .05	.03½	.05½	.04½	.05½
Imp, bgs lb.	.05 .06	.05	.06	.05	.06
Rice, 200 lb bbls lb.	... .07¼	...	.07¼	...	.07¼
Wheat, thick, bgs lb.	.06¾ nom.	.06¾	.07	.07	.08½
Strontium carbonate, 600 lb bbls, wks lb.	.07¼ .07½	.07¼	.07½	.07¼	.07½
Nitrate, 600 lb bbls, NY lb.	.08¼ .09¼	.07¾	.09¼	.07¾	.08¾
Sucrose octa-acetate, den, grd, bbls, wks lb.	... .45	...	.45	...	.45
tech, bbls, wks lb.	.40		.40		.40
Sulfur, crude, f.o.b. mines ton	18.00 19.00	18.00	19.00	18.00	19.00
Flour, coml, bgs 100 lb.	1.65 2.35	1.65	2.35	1.65	2.35
bbls 100 lb.	1.95 2.70	1.95	2.70	1.95	2.70
Rubbermakers, bgs 100 lb.	2.20 2.80	2.20	2.80	2.20	2.80
bbls 100 lb.	2.55 3.15	2.55	3.15	2.55	3.15
Extra fine, bgs 100 lb.	2.85 3.00	2.85	3.00	2.85	3.00
Superfine, bgs 100 lb.	2.65 2.80	2.65	2.80	2.65	2.80
bbls 100 lb.	2.25 3.10	2.25	3.10	2.25	3.10
Flowers, bgs 100 lb.	3.00 3.75	3.00	3.75	3.00	3.75
bbls 100 lb.	3.35 4.10	3.35	4.10	3.35	4.10
Roll, bgs 100 lb.	2.35 3.10	2.35	3.10	2.35	3.10
bbls 100 lb.	2.50 3.25	2.50	3.25	2.50	3.25
Sulfur Chloride, 700 lb drs, wks lb.	.03 .04	.03	.04	.02½	.04
Sulfur Dioxide, 150 lb cyl lb.	.07 .09	.07	.09	.07	.09
Multiple units, wks lb.	.04½ .07	.04½	.07	.04½	.07
tks, wks lb.	.04 .05	.04	.05	.04	.05
Refrigeration, cyl, wks lb.	.16 .17	.16	.17	.15	.17
Multiple units, wks lb.	.07½ .10	.07½	.10	.07½	.10
Sulfuryl Chloride lb.	.15 .40	.15	.40	.15	.40
Sumac, Italian, grd ton	64.50	62.00	66.00	58.50	65.00
Extract, 42°, bbls lb.	.05¼ .06¼	.05¼	.06¼	.05¼	.06¼
Superphosphate, 16% bulk, wks ton	... 9.00	...	9.00	8.25	9.00
Run of pile ton	... 8.50	...	8.50	8.00	8.50
Triple, 44-45%, a. p. a. bulk, wks, Balt. unit ton	.85		.85	.70	.85
Talc, Crude, 100 lb bgs, NY ton	13.00 15.00	13.00	15.00	13.00	15.00
Ref'd, 100 lb bgs, NY ton	14.00 16.00	14.00	16.00	14.00	16.00
French, 220 lb bgs, NY ton	23.00 30.00	23.00	30.00	23.00	30.00
Ref'd, white, bgs, NY ton	45.00 60.00	45.00	60.00	45.00	60.00
Italian, 220 lb bgs to arr ton	60.00 62.00	60.00	62.00	60.00	62.00
Ref'd, white, bgs, NY ton	65.00 70.00	65.00	70.00	65.00	70.00
Tankage Grd, NY unit u	... 2.80	2.80	3.00	3.00	4.40
Ungrd unit u	... 2.70	2.70	2.90	2.80	4.35
Fert grade, f.o.b. Chgo unit u	... 2.55	2.55	2.75	2.75	4.00
South American cif unit u	... 3.00	3.00	3.45	3.15	4.25
Tapioca Flour, high grade, bgs lb.	.03¼ .05½	.03¼	.05½	.03¼	.05½
Tar Acid Oil, 15%, drs gal.	.22½ .25½	.22½	.25½	.21	.25½
25%, drs gal.	.26½ .29½	.26½	.29½	.24½	.29½
Tar, pine, delv, drs gal.	... .26	...	.26	...	.26
tks, delv, E. cities gal.	... .20	...	.20	...	.20
Tartar Emetic, tech, bbls lb.	.26¾ .27	.26¾	.27	.24¾	.27
USP, bbls lb.	.32 .32½	.32	.32½	.30	.32½

† Bags 15c lower; u + 10; *Bbls. are 20c higher.

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Terpineol
Zinc Metal

Prices

	Current Market		1938 Low	1938 High	1937 Low	1937 High
Terpineol, den grade, drs..lb.	...	.17	...	.17	.13¾	.14½
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachloroethylene, drs, tech .....lb.	...	.09½	...	.09½	...	.10½
Tetralene, 50 gal drs, wks lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbls..lb.	.20	.25	.20	.25	.20	.25
Tin, crystals, 500 lb bbls, wks lb.	.32	.32	.33	.34½	.33	.46
Metal, NY .....lb.	...	.38⅛	.38⅛	.4295	.41	.66
Oxide, 300 lb bbls, wks..lb.	.47	.49	.47	.50	.48	.62
Tetrachloride, 100 lb drs, wks .....lb.	...	.19½	.20¾	.21¾	.21	.32
Titanium Dioxide, 300 lb bbls lb.	.16¼	.17	.16¼	.17	.16¼	.17
Barium Pigment, bbls ..lb.	.06⅛	.06⅜	.06⅛	.06⅜	.06	.06⅜
Calcium Pigment, bbls ..lb.	.06⅛	.06⅜	.06⅛	.06⅜	.06	.06⅜
Toluidine, mixed, 900 lb drs, wks .....lb.	.26	.27	.26	.27	.26	.27
Toluol, 110 gal drs, wks..gal.	...	.35	...	.35	...	.35
8000 gal tks, frt all'd ..gal.	...	.30	...	.30	...	.30
Toner Lithol, red, bbls ....lb.	.75	.80	.75	.80	.75	.80
Para, red, bbls .....lb.	.75	.80	.75	.80	...	.75
Toluidine, bgs .....lb.	...	1.35	...	1.35	...	1.35
Triacetin, 50 gal drs, wks lb.	...	.36	...	.36	...	.36
Triamyl Borate, lcl, drs, wks lb.	...	.27	...	.27	...	.27
Triamylamine, c-l, drs, wks lb.	.77	1.25	.77	1.25	.77	1.25
Tributylamine, lcl, drs, wks lb.	...	.70	...	.70	...	...
Tributyl citrate, drs, frt all'd lb.	...	.45	...	.45	...	.45
Tributyl Phosphate, frt all'd lb.	...	.50	...	.50	...	.50
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts ..lb.	.089	.094	.089	.094	.089	.094
Tricresyl phosphate, tech, drs lb.	.24½	.39	.24½	.39	.22½	.26½
Triethanolamine, 50 gal drs wks .....lb.	.21	.22	.21	.22	.21	.30
tks, wks .....lb.	...	.20	...	.20	.20	.25
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	...
Trihydroxyethylamine Oleate, bbls .....lb.	...	.30	...	.30	...	...
Stearate, bbls .....lb.	...	.30	...	.30	...	...
Trimethylamine, c-l, drs, frt all'd E. Mississippi .....lb.	...	1.00	...	1.00	...	1.00
Triphenylguanidine .....lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs ..lb.	.34	.36	.34	.36	...	...
Tripoli, airfloated, bgs, wks ton	26.00	30.00	26.00	30.00	25.00	30.00
Turpentine (Spirits), c-l, NY dock, bbls .....gal.	.29	.29½	.29	.31½	.31	.47
Savannah, bbls .....gal.	.23	.23½	.23	.30¾	.25	.42
Jacksonville, bbls .....gal.	...	.23½	.23½	.30¾	.25	.41
Wood Steam dist, bbls, c-l, NY .....gal.	...	.27	.27	.31	.30	.44
Wood, dest dist, c-l, drs, delv E. cities .....gal.	...	.36	.33	.36	...	...
Urea, pure, 112 lb cases ..lb.	.14½	.15½	.14½	.15½	.14½	.15½
Fert grade, bgs, c.i.f. ..ton	...	...	...	...	...	...
c.i.f. S.A. points ....ton	95.00	110.00	95.00	110.00	95.00	110.00
Dom, f.o.b., wks ton	95.00	101.00	95.00	101.00	95.00	101.00
Urea Ammonia liq 55% NH_3, tks .....unit	...	1.04	...	1.04	1.00	1.04
Valonia beard, 42%, tannin bgs .....ton	...	50.00	50.00	52.00	35.00	52.00
Cups, 32% tannin, bgs..ton	35.50	37.50	35.50	37.50	31.50	36.00
Extract, powd, 63% ....lb.	...	.06	...	.06	...	...
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots .....lb.	...	3.10	...	3.10	3.10	3.65
Ex-guaiacol .....lb.	...	3.00	...	3.00	3.00	3.55
Vermilion, English, kgs ..lb.	1.45	1.54	1.45	1.69	1.60	1.90
Wattle Bark, bgs .....ton	39.75	41.75	39.75	41.75	31.00	43.75
Extract, 60°, tks, bbls ..lb.	...	.04⅜	.04⅜	.04⅝	.03⅝	.04⅝

WAXES

Wax, Bayberry, bgs .....lb.	.16⅞	.17	.16⅞	.17	.16½	.17½
Bees, bleached, white 500 lb slabs, cases .....lb.	.35	.39	.35	.45	.38	.45
Yellow, African, bgs..lb.	.24	.25	.24	.26	.25	.30
Brazilian, bgs .....lb.	.25½	.27½	.25½	.29	.27	.34
Chilean, bgs .....lb.	.25½	.27½	.25½	.29	.27	.34
Refined, 500 lb slabs, cases lb.	.32	.35	.32	.39	.29½	.39
Candelilla, bgs .....lb.	.14½	.15	.13½	.15	.13	.16½
Carnauba, No. 1, yellow, bgs .....lb.	.38	.39½	.38	.44	.42	.49
No. 2, yellow, bgs ....lb.	.37	.37½	.37	.42	.41	.46½
No. 2, N. C., bgs .....lb.	.35½	.36	.35½	.40	.38	.43
No. 3, Chalky, bgs ...lb.	.32½	.34	.32½	.35	.33	.40
No. 3, N. C., bgs .....lb.	.32½	.33	.32½	.35½	.34	.43
Ceresin, dom, bgs .....lb.	.08½	.11½	.08½	.11½	.08	.12
Japan, 224 lb cases .....lb.	.09¾	.10¼	.09¾	.10½	.09½	.11¼
Montan, crude, bgs .....lb.	.11	.12	.11	.12	.11	.12
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.23	.24	.23	.24	.23	.24
Cakes, cases .....lb.	.24	.25	.24	.25	.24	.25
Whiting, chalk, com, 200 lb bgs c-l, wks .....ton	12.00	14.00	12.00	14.00	12.00	14.00
Gilders, bgs, c-l, wks ..ton	...	15.00	...	15.00	...	15.00
Wood Flour, c-l, bgs ....ton	20.00	33.00	20.00	33.00	18.00	30.00
Xylol, frt allowed, East 10° tks, wks .....gal.	...	.33	...	.33	...	.33
Coml, tks, wks, frt all'd gal.	...	.30	...	.30	...	.30
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Zinc Acetate, tech, bbls, lcl, delv .....lb.	...	.21	...	.21	...	...
Arsenate, bgs, frt all'd ..lb.	.12½	.13	.12½	.13½	...	...
Arsenite, bgs, frt all'd ..lb.	.12½	.13	.12½	.13	...	...
Carbonate tech, bbls, NY lb.	.14	.15	.14	.15	.12	.15
Chloride fused, 600 lb drs, wks .....lb.	.04½	.046	.04½	.046	.04½	.046
Gran, 500 lb drs, wks lb.	.05	.05¾	.05	.05¾	.05	.05¾
Soln 50%, tks, wks 100 lb.	...	2.25	...	2.25	2.00	2.25
Cyanide, 100 lb drs ..lb.	.36	.38	.36	.38	.36	.38
Dust, 500 lb bbls, c-l, delv lb.	...	.06¼	.06¼	.0740	.0740	.094
Metal, high grade slabs, c-l, NY .....100 lb.	...	4.60	4.60	5.35	5.35	7.85
E. St. Louis ...100 lb.	...	4.25	4.25	5.00	5.00	7.50

Current

Zinc Oxide
Oil, Whale

		Current Market		1938 Low	1938 High	1937 Low	1937 High
Zinc (continued):							
Oxide, Amer, bgs, wks	lb.	.06¾	.07½	.06	.07½	.05⅝	.07¾
French 300 lb bbls, wks	lb.	.06¼	.07¾	.06¼	.07¾	.05½	.07¾
Palmitate, bbls	lb.	.23	.25	.23	.25	.23	.25
Resinate, fused, pale, bbls	lb.	...	.10	...	.10	.09	.10
Stearate, 50 lb bbls	lb.	.20	.23	.20	.23	.20	.23
Zinc Sulfate, crys, 400 lb bbl, wks	lb.	...	.033	...	.033	.028	.033
Flake, bbls	lb.	...	.0375	...	.0375	.032	.0375
Sulfide, 500 lb bbls, delv	lb.	.09¼	.09¾	.09¼	.09¾	.09¼	.09¾
bgs, delv	lb.	.09	.09½	.09	.09½	.09	.09½
Sulfocarbolate, 100 lb kgs	lb.	.24	.26	.24	.26	.24	.26
Zirconium Oxide, crude, 73-75% grd, bbls, wks	ton	75.00	100.00	75.00	100.00	...	...
kgs, wks	lb.	.04¼	.04½	.04¼	.04½	...	...

Oils and Fats

Babassu, tks, futures	lb.	...	.06⅝	.06⅝	.06¾	.06¾	.11¼
Castor, No. 3, 400 lb bbls	lb.	.09¼	.10	.09¼	.10¾	.10¼	.10¾
Blown, 400 lb bbls	lb.	.11¼	.12	.11¼	.13	.12¼	.13
China Wood, drs, spot NY	lb.	.12	.12½	.12½	.15¼	.12½	.23
Tks, spot NY	lb.	.11½	.11¾	.11½	.15½	.118	.23
Coast, tks	lb.	...	nom.	...	...	.133	.23
Coconut, edible, bbls NY	lb.	...	.09¼	.09¼	.09½	.09¼	.15
Manila, tks, NY	lb.	...	.03⅝	.03⅝	.04¼	.04	.09½
Tks, Pacific Coast	lb.	.03⅜	.03½	.03⅜	.03¾	.03¾	.08⅞
Cod, Newfoundland, 50 gal bbls	gal.	.50	nom.	.50	.52	.51	.52
Copra, bgs, NY	lb.	...	.02025	.02025	.0235	.0235	.055
Corn, crude, tks, mills	lb.	.07½	.07⅝	.06⅝	.07¾	.06½	.10¾
Refd, 375 lb bbls, NY	lb.	.10	.10¼	.09¼	.10¼	.09	.13¼
Degras, American, 50 gal bbls, NY	lb.	.07¾	.08¼	.07½	.08¼	.07½	.08¼
English, bbls, NY	lb.	.07¾	.08¼	.07½	.08¼	.07½	.08¼
Greases, Yellow	lb.	.04⅛	.04⅜	.04⅛	.05½	.04¼	.09
White, choice bbls, NY	lb.	...	.05⅝	.05⅝	.07	.06¾	.10¼
Lard Oil, edible, prime	lb.	...	.12¼	.12¼	.12¾	.12¾	.16¾
Extra, bbls	lb.	...	.10	.10	.10¾	.10¾	.13½
Extra, No. 1, bbls	lb.	...	.09½	.09¼	.09¾	.09¼	.13½
Linseed, Raw less than 5 bbl lots	lb.	.105	.107	.105	.115	.107	.121
bbls, c-l, spot	lb.	.097	.099	.097	.102	.099	.113
Tks	lb.	...	.091	.091	.096	.093	.107
Menhaden, tks, Baltimore	gal.	.35	nom.	.34½	.37½	.34	.45
Refined, alkali, drs	lb.	.093	.095	.08	.095	.08	.10
Tks	lb.	...	.087	.074	.087	.074	.09
Kettle bodied, drs	lb.	.103	.105	.09	.105	.09	.11
Light pressed, drs	lb.	.087	.091	.074	.091	.074	.094
Tks	lb.	...	.08	.067	.08	.067	.084
Neatsfoot, CT, 20°, bbls, NY	lb.	...	.16¼	.16¼	.17¼	.16¾	.18¼
Extra, bbls, NY	lb.	...	.09¾	.09½	.10	.09½	.13¾
Pure, bbls, NY	lb.	...	.12¼	.11¾	.12¼	.11¾	.14¼
Oiticica, bbls	lb.	.10½	.11	.10½	.12¾	.10⅞	.17
Oleo, No. 1, bbls, NY	lb.	...	.09	.09	.10½	.10½	.14½
No. 2, bbls, NY	lb.	...	.08½	.08½	.10	.10	.14
Olive, denat, bbls, NY	gal.	1.00	1.10	1.00	1.20	1.15	1.65
Edible, bbls, NY	gal.	1.90	2.00	1.90	2.35	2.20	2.50
Foots, bbls, NY	lb.	.08¾	.09	.08¾	.09⅞	.09⅝	.12½
Palm, Kernel, bulk	lb.	...	.04⅛	.04⅛	.04½	.04½	.08⅛
Niger, cks	lb.	.04	.04¼	.04	.04½	.04	.07¼
Sumatra, tks	lb.	...	.03⅝	.03⅝	.0375	.0375	.06½
Peanut, crude, bbls, NY	lb.	...	.07½	.07	.07½	.06¼	.10⅝
Tks, f.o.b. mill	lb.	.07⅜	.07½	.06⅝	.07½	.06½	.10¼
Refined, bbls, NY	lb.	.10⅛	.10¼	.10	.10¼	.10	.13½
Perilla, drs, NY	lb.	.10½	.10¾	.10½	.11¾	.11	.13½
Tks, Coast	lb.	.10¼	.10½	.10¼	.11	.105	.13
Pine, see Pine Oil, Chemical Section.							
Rapeseed, blown, bbls, NY	lb.	.14½	.14¾	.14½	.14¾	.13	.14¾
Denatured, drs, NY	gal.	.88	.90	.88	.91	.85	.97
Red, Distilled, bbls	lb.	.09⅝	.10⅝	.09⅝	.10⅝	.09⅝	.12⅝
Tks	lb.	.08¾	.09¾	.08¾	.09¾	.08¾	.10¾
Sardine, Pac Coast, tks	gal.	...	.46½	.37	.46½	.35	.55
Refined alkali, drs	lb.	.093	.095	.08	.095	.08	.10
Tks	lb.	...	.087	.074	.087	.074	.09
Light pressed, drs	lb.	.087	.089	.074	.089	.074	.094
Tks	lb.	...	.08	.067	.08	.067	.084
Sesame, yellow, dom	lb.	.10¼	.10½	.10¼	.10½	.10¼	.13¼
White, dom	lb.	.10¼	.10½	.10¼	.10½	.10¼	.13¼
Soy Bean, crude							
Dom, tks, f.o.b. mills	lb.	...	.07	.06	.07	.06	.10½
Crude, drs, NY	lb.	.078	.08	.066	.08	.066	.11½
Ref'd, drs, NY	lb.	.088	.097	.078	.097	.078	.12½
Tks	lb.	...	.082	.072	.082	.072	.11½
Sperm, 38° CT, bleached, bbls NY	lb.	.10	.102	.10	.102	.096	.102
45° CT, bleached, bbls, NY	lb.	.093	.095	.093	.095	.089	.095
Stearic Acid, double pressed dist bgs	lb.	.11	.12	.11	.12	.11	.13½
Double pressed saponified bgs	lb.	.11¼	.12¼	.11¼	.12¼	.11¼	.13¾
Triple pressed dist bgs	lb.	.14	.15	.14	.15	.14	.16½
Stearine, Oleo, bbls	lb.	.07¼	.07½	.07	.08	.07	.11½
Tallow City, extra loose	lb.	...	.05⅜	.05⅜	.06⅜	.05⅞	.09¼
Edible, tierces	lb.	...	.06¼	.06¼	.07¼	.06⅞	.10¼
Acidless, tks, NY	lb.	...	.08¾	.08¾	.09¼	.09	.13
Turkey Red, single, bbls	lb.	.08	.08½	.08	.08½	.08	.08½
Double, bbls	lb.	.12½	.13	.12½	.13	.12½	.13
Whale:							
Winter bleach, bbls, NY	lb.	.098	.10	.098	.10	.091	.111
Refined, net, bbls, NY	lb.	.094	.096	.094	.096	.087	.107

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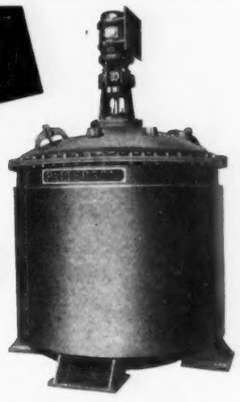

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"We"—Editorially Speaking

Medal of the Month goes to Edgar M. Queeny for his fine "Employees Edition" of his annual report to the Monsanto stockholders—a splendidly frank and understandable document.

❖❖❖❖

Light-metal alloys have made the airplane—but during the past five years aluminum shoes on thoroughbreds have broken more than 300 track records on the American turf.

❖❖❖❖

Then, too, the photoelectric eye has been put to work, automatically raising awnings when the sun shines and lowering them when it rains.

❖❖❖❖

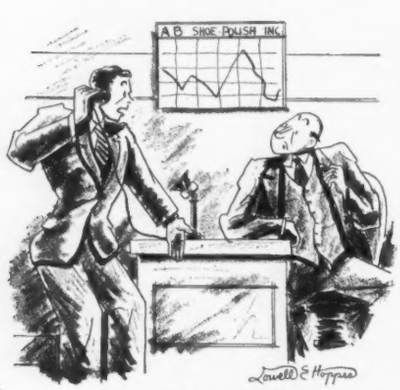
Press agent for Ethyl Gas tells us that $136,595,390 worth of chemicals flow unrecovered in the sea water through the Kure Beach bromine plant, to wit: .071 tons of gold, 2.22 tons of silver, 13.02 tons of copper, 2058 tons of iron, to say nothing of 89,900 tons of magnesium, 165,700 tons of calcium chloride, 195.2 tons of aluminum, 85,900 tons of potassium chloride, 225.9 tons of strontium carbonate, and last but not least 3,005,000 tons of just plain common salt.

❖❖❖❖

So what? sez "We." And then "We" bethought that no doubt such a flashy news release means that in the near future Dow must be going to do something about it, so we've wired for an option on the strontium carbonate till after July fourth next.

❖❖❖❖

"We" collected enough Chute-isms at the Chemists' Club dinner, last March 22, to fill this here colyum for six issues.



Courtesy "Hide & Leather"

He says he used our polish on his car and now it is walking . . .

Fifteen Years Ago

From our issues of April, 1923

H. S. Farleigh, chemical broker, is now located at 99 John St., New York City.

Allied Chemical & Dye re-elects entire Board of Directors for ensuing year.

A. C. S. gathers at New Haven for 65th annual convention.

Pittsburgh Plate Glass, Akron, O., constructing $1,000,000 cement plant at Fultonham, O.

Phosphate deposits rivalling those in Florida have been discovered in Morocco.

Harry A. Curtis to take charge investigation of nitrates in Dept. of Commerce survey of raw materials produced under monopoly conditions abroad.

Air Reduction earns nearly $12 a share, first quarter this year, on no par capital stock.

C. W. Nichols resigns as vice president, General Chemical, owing to press of duties as president, Nichols Copper.

That dinner was a pleasant and appropriate event, the like of which should be repeated in friendly recognition of the worth of a score of our too-little-appreciated leaders in science, in education, and in industry. "We" nominate, for a starter, to such a distinguished honor Max Toch, "M. C." Whitaker, Cressy Morrison, and Warren Kendall Lewis.

❖❖❖❖

And why not forgather with the heads of the M. C. A., the A. C. S., and the I. Ch.E.?

❖❖❖❖

A series of such little dinner parties would be infinitely useful in bringing technicians, teachers, and executives together.

❖❖❖❖

Besides, if the N. Y. Board of Trade and Transportation can eat its way out of a deficit, why can't the Chemists' Club?

❖❖❖❖

Another sidelight on the world nitrogen situation is thrown in *Transgressor in the Tropics*: "In the good old nitrate days (before that rude German invented the process whereby you could take it out of the sky and nearly sank Chile in consequence) the great British companies used to induce sporting young Englishmen to remain up on the God-forsaken nitrate pampas by giving them free champagne and polo ponies."

❖❖❖❖

That has a bit of the tang of "facts" marshalled in "America's Sixty Families."

❖❖❖❖

Speaking of which, "We" are reminded to thank publicly the du Pont Company for forcing the author of that glibly written caricature of American history to admit libel. Flagrant and delicate misstatements of facts are becoming an altogether too common means of smearing propaganda or squirming justification, and the courage to nail down such falsehoods is as commendable as it is needed.

❖❖❖❖

The elevation of a lively and likeable member of the Chemists' Club to a high dignitary of the Church is another matter of well deserved congratulation.

❖❖❖❖

Did you know—

That more than 12 million gallons of muriatic acid were used last year in 5,000 gas and oil well treatments?

That William S. Gray has been an active member of the New York State Chamber of Commerce thirty-eight years, being elected with John D. Rockefeller, Jr., Percy Strauss, and Cornelius Vanderbilt?

Courtesy "National Cleaner & Dyer"

He's been eating onions again.

TECHNOLOGY DEPT.

VOL. 42 Apr. '38

CHEMICAL INDUSTRIES

Statistical and Technical Data Section

NO. 4 Part 2

State of Chemical Trade

Current Statistics (Mar. 31, 1938)—p. 7

WEEKLY STATISTICS OF BUSINESS

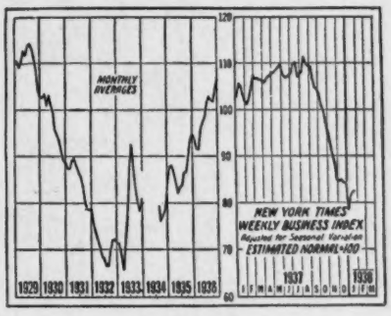
Week Ending	Carloadings 1938	Carloadings 1937	Carloadings % of Change	Electrical Output* 1938	Electrical Output* 1937	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Fertilizer Ass'n Price Indices: Chem. & Drugs	Fats & Oils	Fert. Mat.	Mixed Fert.	All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher's Index Pur. Power
Feb. 19.....	535,790	711,314	—24.7	2,059,165	2,211,818	— 6.9	78.8	95.4	64.3	72.3	78.7	76.3	78.8	30.4	79.0	121.3
Feb. 26.....	511,930	692,393	—26.1	2,031,412	2,207,285	— 8.0	79.2	95.4	65.0	72.2	78.7	76.8	78.9	29.3	78.9	120.5
Mar. 5.....	552,916	730,339	—24.3	2,035,673	2,199,976	— 7.5	78.3	95.0	64.7	72.1	78.7	76.4	78.9	29.9	78.7	120.5
Mar. 12.....	556,664	743,999	—25.2	2,014,729	2,212,897	— 9.0	78.5	95.0	64.7	72.1	78.7	76.4	78.6	32.1	79.2	120.8
Mar. 19.....	540,332	754,922	—28.4	2,017,653	2,211,052	— 8.7	78.4	95.0	64.5	72.1	77.8	76.0	78.4	33.7	79.2	121.5
Mar. 26.....	572,952	756,416	—24.3	1,975,239	2,200,143	—10.2	78.3	95.0	62.9	72.1	77.8	75.8	78.1	35.7	80.1	....

* K.W.H., 000 omitted; † 1926-1928 = 100.0.

MONTHLY STATISTICS

CHEMICAL:	February 1938	February 1937	January 1938	January 1937	December 1937	December 1936
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	.....	.....	178,979	183,794	176,492	199,508	182,217
Consumpt. in mfr. fert.	.....	.....	164,880	147,443	164,320	189,960	180,560
Stocks end of month	.....	.....	74,400	89,662	72,473	87,290	71,636
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal.	16,708,492	17,571,664	15,847,102	18,704,895	17,261,669	19,913,228
Comp. denat. prod., wine gal.	153,361	486,698	168,465	667,706	1,826,806	1,831,934
Removed, wine gal.	151,155	424,528	178,156	639,069	1,841,127	1,990,349
Stocks end of mo., wine gal.	540,245	767,112	537,257	705,723	546,647	677,897
Spec. denat. prod., wine gal.	4,934,113	4,987,938	5,714,329	6,138,820	5,185,096	9,284,288
Removed, wine gal.	4,845,397	4,986,079	5,761,436	6,084,658	5,128,171	9,298,963
Stocks end of mo., wine gal.	638,597	501,387	555,318	502,866	606,222	452,613
Ammonia sulfate prod., tons *a*	32,959	63,861	37,246	69,698	43,211	67,749
Benzol prod., gals *b*	5,575,000	9,522,000	6,155,000	10,369,000	6,340,000	10,376,000
Byproduct coke, prod., tons *a*	2,493,586	3,991,481	2,762,474	4,357,632	2,829,225	4,354,000
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	444,871	1,557,356	432,377	1,342,780	412,887	1,054,662
Sheets, ship., lbs.	492,087	1,301,177	625,686	1,199,169	514,027	1,151,581
Rods, prod., lbs.	185,607	347,783	165,498	281,539	148,889	259,506
Rods, ship., lbs.	183,112	317,594	201,458	300,368	139,682	255,832
Tubes, prod., lbs.	44,372	71,065	48,499	90,187	40,701	83,373
Tubes, ship., lbs.	40,859	68,696	53,851	61,609	46,257	71,154
Cellulose acetate, sheets, rods, tubes:						
Production, lbs.	337,938	1,269,775	344,539	853,376	624,078	1,255,494
Shipments, lbs.	288,761	1,396,509	375,945	742,380	602,887	1,111,530
Methanol (Bureau of the Census)						
Production, crude, gals.	404,970	500,685	458,347	525,070	461,539	548,982
Production, synthetic, gals.	2,290,609	1,849,302	2,896,894	1,835,815	3,887,741	2,009,952
Pyroxylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds.	2,575,661	3,664,189	1,887,057	3,515,383	1,890,806	3,423,170
Heavy goods, ship., linear yds.	1,511,615	2,142,082	1,392,924	2,102,800	1,280,338	2,072,049
Pyroxylin spreads, lbs. *c*	4,258,768	6,498,204	3,602,058	5,964,572	3,365,894	5,648,328
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*	$8,784	$9,954	$9,720	$9,197	$10,785	$10,484
Crude sulfur, *d*	$1,017	$373	$811	$730	$781	$507
Coal-tar chemicals *d*	$539	$1,078	$567	$1,065	$1,113	$1,539
Chemical specialties *d*	$1,894	$1,997	$1,891	$2,080	$1,856	$2,062
Industrial chemicals *d*	$1,810	$1,933	$2,071	$1,649	$1,939	$1,908
Imports						
Chemicals and related prod. *d*	$6,120	$9,739	$7,127	$8,564	$8,261	$8,334
Coal-tar chemicals *d*	$1,270	$1,369	$1,379	$1,335	$1,482	$1,960
Industrial chemicals *d*	$1,014	$2,265	$1,261	$2,243	$1,551	$2,078
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100)						
Chemicals and allied prod., including petroleum	119.4	123.6	117.4	119.4	134.4	118.3
Other than petroleum	113.9	123.9	112.2	119.4	120.3	118.0
Chemicals	123.0	135.2	124.8	131.8	130.4	132.5
Explosives	92.6	93.0	82.3	97.8	100.3	98.0
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100)						
Chemicals and allied prod., including petroleum	113.0	121.9	112.5	120.2	116.3	119.3
Other than petroleum	112.0	122.4	111.0	120.4	115.4	119.3
Chemicals	115.3	131.4	118.3	130.8	122.6	129.1
Explosives	87.4	93.2	90.2	94.0	94.7	93.2
Stocks of chemicals, etc.:**						
Finished	.....	.....	173	143	164	131
Raw material	.....	.....	118	93	124	104
FERTILIZER:						
Exports (short tons, Nat. Fert. Association)						
Fertilizer and fert. materials	.....	66,401	121,745	68,322	151,394	75,975
Ammonium sulfate	.....	304	4,706	474	3,575	36
Total phosphate rock	.....	42,348	78,785	50,272	114,201	55,042
Total potash fertilizers	.....	2,818	886	1,431	4,525	1,558

INDUSTRIAL TRENDS



Business: While business activity showed a slight gain for the month, sentiment in industrial and financial circles is still reported more or less pessimistic.

Steel: Activity has gained over the past 4 weeks, but the rate of 35.7% is still far from encouraging. Improved buying has come from miscellaneous customers, with the automotive industry and the railroads still in minor roles.

Automobiles: March output is estimated to have been only slightly in excess of February, but bullish sentiment in the Detroit area is lacking, despite promising headway in the marketing of used cars.

Paints, Varnish: A seasonal upswing finally got under way in March. However, a comparison with corresponding period of '37 shows how severe the decline has really been. Industry is in a more hopeful frame of mind though, based on the sudden spurt in modernization and building loans in the last few weeks. Strong likelihood that season will be late and in better volume than anticipated a month ago.

Textiles: This division of industry was one of the few bright spots in February. Some leveling off took place in the final two weeks of March in cotton, silk, and wool. Rayon output, on the other hand, is expanding in an encouraging manner.

Retail Trade: Comparison with the same weeks of last year shows a decline of about 17%. This figure is influenced, however, by the lateness of the Easter season.

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Rubber: Still in the doldrums. February consumption of crude was over 50% below the corresponding period for '37, and March figure is not expected to provide any decided improvement. Labor problems still beset the Akron area.

Leather: A brighter tone is in evidence in shoe manufacturing centers.

Wholesale Trade: Shipments are below '37 by a rather wide margin. Some improvement is in evidence as retailers prepare for the Easter period.

Carloadings: Were between 24 and 28% below the corresponding weeks of last year. Even the imminence of higher freight rates failed to boost the volume.

Electrical Consumption: At the '38 low point in the week ending Mar. 26. Running from 7 to 10% below corresponding weeks of last year.

Commodity Prices: Pessimistic news depressed most markets and all important wholesale price indices registered new lows for the current recession.

Construction: The upswing, particularly in home building, is encouraging and is expected to show further expansion over the next few months.

Outlook: Momentarily business men appear to be more upset over the outcome of the struggle between the President and congressional conservatives for control than in the relatively poor state of business. The bitter fight over the reorganization measure has been most disturbing and adds greatly to the general feeling of uncertainty just when some measure of improved sentiment might have developed on the strength of the likely revision of corporate and capital gains taxes. The freight rate increases granted in March have so far failed to stimulate any buying by the carriers. The European situation became highly critical with the Nazi march on Austria early in the month, and for several days the beginning of another world war seemed almost a certainty. But Europe again staved off another crisis without resorting to war, and as the month closed a slightly better feeling existed. The stock market was rocked badly in the last 30 days by adverse domestic and foreign happenings and values melted away alarmingly. Prices generally are back at '35 levels. So far there are few signs of the beginning of a sustained improvement in business. Many business forecasters are now predicting that the upturn will not occur until early fall. Important cyclical improvements in the past have taken place in the fall more often than in other seasons.

MONTHLY STATISTICS (cont'd)

FERTILIZER (cont'd)	February 1938	February 1937	January 1938	January 1937	December 1937	December 1936
Imports (short tons, Nat. Fert. Association)						
Fertilizer and fert. materials	.....	261,193	189,174	223,230	222,238	180,445
Ammonium sulfate	.....	18,165	7,105	720	6,419	2,707
Sodium nitrate	.....	118,396	84,122	58,949	62,644	32,963
Total potash fertilizer	.....	37,351	48,083	125,360	104,527	98,541
Superphosphate e (Nat. Fert. Association)						
Production, bulk	251,999	317,015	299,484	320,164	357,479	331,160
Shipments, total	278,511	309,763	188,525	201,181	190,089	197,518
Northern area	98,542	85,329	68,747	58,476	88,274	85,916
Southern area	179,969	224,434	119,778	142,705	101,815	111,602
Stocks, end of month, total	2,030,579	1,798,950	2,013,189	1,735,979	1,845,001	1,535,208
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	759,813	806,002	468,340	438,326	186,941	178,204
Total, 12 southern	693,855	764,356	446,504	421,944	184,948	177,978
Total, 5 midwest	65,958	41,646	21,836	16,382	1,993	226
Fertilizer payrolls	87.5	86.9	78.5	77.8	82.3	71.6
Fertilizer employment	94.6	96.1	82.6	87.1	81.6	80.4
Value imports, fert. and mat. *d*	$3,206	$5,097	$3,736	$4,226	$4,318	$3,487
Value exports, fert. and mat. *d*	$1,087	$789	$1,353	$635	$1,291	$673
GENERAL:						
Acceptances outst'd'g *f*	$307	$401	$326	$387	$343	$373
Coal prod., anthracite, tons	3,056,728	3,042,496	4,421,519	3,673,605	4,752,000	4,947,000
Coal prod., bituminous, tons	27,000,000	42,110,000	30,880,000	40,940,000	36,226,000	45,756,000
Com. paper outst'd'g *f*	$293	$268	$299	.....	$279	$215
Failures, Dun & Bradstreet	1,071	721	1,320	811	932	692
Factory payrolls *i*	73.5	95.8	71.6	90.7	80.9	95.2
Factory employment *i*	82.5	99.0	82.2	96.5	88.6	98.1
Merchandise imports *i*	$163,085	$277,709	$170,763	$240,452	$203,700	$240,230
Merchandise exports *i*	$262,733	$233,125	$298,437	$222,665	$319,756	$229,800
GENERAL MANUFACTURING:						
Automotive production	186,806	364,193	210,120	379,843	326,234	498,710
Boot and shoe prod., pairs	29,767,420	39,577,566	25,523,389	36,674,179	21,047,582	33,380,528
Bldg. contracts, Dodge *j*	$119,038	.....	$195,472	$242,844	$209,451	$199,696
Newsprint prod., U. S., tons	61,357	72,072	72,514	80,005	79,537	80,048
Newsprint prod., Canada, tons	202,601	275,532	222,500	287,691	293,038	289,312
Plate glass prod., sq. ft.	.....	.....	5,119,182	6,373,282	8,920,809	7,371,236
Steel ingot prod., tons	1,703,245	4,413,832	1,732,266	4,724,894	1,472,241	4,424,367
% steel capacity	31.73	84.25	29.14	81.43	25.36	76.42
Pig iron prod., tons	1,298,268	2,992,218	1,429,085	3,211,500	1,478,843	3,115,037
U.S. consumpt. crude rub., tons	23,868	51,887	29,429	50,818	29,160	49,626
Cotton consumpt., bales	427,528	665,677	434,740	678,786	433,058	694,841
Cotton spindles oper.	22,356,638	24,517,706	22,327,444	24,364,802	22,328,472	24,090,204
Silk deliveries, bales	30,260	58,484	30,715	44,198	21,982	41,627
Rayon ship., index *p*	.....	.....	374	737	240	713
Rayon employment *i*	329.2	370.4	315.2	367.6	336.8	362.4
Rayon payrolls *i*	283.4	344.5	275.5	338.1	313.5	321.3
Soap employment *i*	96.6	109.8	94.0	100.3	94.6	98.8
Soap payrolls *i*	111.4	124.5	109.2	107.1	111.2	104.3
Paper and pulp employment *i*	108.8	116.1	108.2	113.7	109.4	112.8
Paper and pulp payrolls *i*	103.2	113.5	98.0	109.9	98.8	108.6
Leather employment *i*	77.2	97.5	76.6	97.0	78.6	98.4
Leather payrolls *i*	79.6	104.6	76.9	102.5	78.5	105.0
Glass employment *i*	85.0	107.6	87.6	92.8	100.0	100.6
Glass payrolls *i*	77.6	107.2	76.2	84.6	95.8	95.1
Rubber prod. employment *i*	74.7	101.6	78.3	101.3	86.0	101.9
Rubber prod. payrolls *i*	59.2	104.4	65.9	99.4	77.1	104.8
Dyeing and fin. employment *i*	104.8	122.8	103.6	122.3	105.3	122.8
Dyeing and fin. payrolls *i*	89.6	111.9	83.9	112.2	86.5	116.4
MISCELLANEOUS:						
Oils and fats, price index	89.7	129.3	88.4	136.5	85.6	128.2
Price index K, rosin	90.8	164.1	101.7	169.8	95.5	157.7
Gasoline prod., bbls.	.....	.....	42,859,000	41,013,000	43,371,000	44,900,000
Cottonseed Oil consumption, bbls.	428,531	.....	369,149	.....	358,328	351,616
Price index, turpentine	50.7	81.2	55.3	83.6	50.3	80.6
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments	.....	.....	$22,115,195	$31,288,615	$19,348,567	$29,464,691
Trade sales (580 establishments)	.....	.....	$11,448,115	$16,042,179	$9,088,658	$13,926,890
Industrial sales, total	.....	.....	$8,282,661	$12,456,616	$8,293,742	$13,435,807
Paint and varnish sales	.....	.....	$5,748,170	$8,906,595	$5,653,369	$8,994,419
Lacquer sales	.....	.....	$2,534,491	$3,550,021	$2,640,373	$4,441,388
Plastic paints, lbs.	.....	.....	424,773	445,836	323,334	438,880
Cold-water paints, lbs.	.....	.....	2,920,462	2,912,294	2,211,965	1,476,809
Calcimines, lbs.	.....	.....	6,061,018	7,040,219	3,856,937	5,900,867

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of the month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100; *j* 000 omitted, 37 states; *p* Rayon Organon, 1923-25 = 100; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce.

Price Trend of Representative Chemical Company Stocks

	Feb. 28	Mar. 4	Mar. 11	Mar. 18	Mar. 25	Mar. 31	Net Gain or loss last mo.	Price on Mar. 31, 1937	1938 High	1938 Low
Air Reduction	52⅝	54¾	52	49½	45	40¼	—12⅜	73¼	58¼	40¼
Allied Chemical	168	168½	161	154½	141⅛	125	—43	245	176½	124
Amer. Cyanamid	25⅞	24½	22½	21¼	17⅞	15¾	—10⅛	32⅝	26⅝	15½
Amer. Agric. Chem.	62	61	...	53½	49½	50	—12	95	66	49
Columbian Carbon	70	68¼	66	67	65½	55	—15	125	76	55
Commercial Solvents	8½	8	7⅞	7	6½	6	— 2½	18⅜	10	5⅞
Dow Chemical	105¼	108	102½	98	...	89*	—16¼	...	112	87⅞
Du Pont	118½	118	136	112	104½	94	—24½	159½	123⅜	90½
Hercules Powder	56	...	51	51¾	48	42¾	—13¼	166	58	42¾
Mathieson Alkali	25¼	26	26½	25⅝	23½	19¾	— 5¼	37½	27½	19¾
Monsanto Chemical	88¾	85½	83	83¾	74½	68½	—20⅛	92½	91½	68¼
Std. of N. J.	53	50¾	49¼	46	42⅞	40¼	—12¾	72⅛	54⅛	39¾
Texas Gulf Sulphur	32¼	32½	31⅛	30¾	29	26½	— 5¾	42½	34	26
Union Carbide	78	76½	71⅞	70⅞	66	58½	—19½	104	80	57
U. S. Ind. Alcohol	19⅝	19	17½	16	15	14	— 5⅝	40⅝	23¼	13½

* Mar. 30.

Earnings Statements Summarized

Company:	Annual dividends	Net income 1937	Net income 1936	Common share earnings 1937	Common share earnings 1936	Surplus after dividends 1937	Surplus after dividends 1936
Air Reduction:							
Year, Dec. 31	§$1.00	$7,326,835	$7,064,553	$2.85	$2.79	*d*$344,756	$103,773
American Cyanamid:							
Year, Dec. 31	§.60	5,268,255	4,454,930	2.09	1.77	.....	.....
American Hard Rubber:							
Year, Dec. 31	*y*2.00	381,554	283,288	3.05	1.55	.....	.....
American Potash & Chemical:							
Year, Dec. 31	*k*3.50	2,336,319	1,907,550	4.42	3.61	.....	.....
American Zinc, Lead & Smelting:							
Dec. 31 quarter	*f*....	†108,322	93,420	....	*r*1.34	.....	.....
Year, Dec. 31	*f*....	184,930	52,336	*r*2.78	*r*.75	.....	.....
Callahan Zinc-Lead:							
Year, Dec. 31	*f*....	†91,912	†68,704	....	....	.....	.....
Canadian Industries:							
Year, Dec. 31	*k*9.50	5,721,682	4,729,330	*c*7.86	*c*6.45	.....	.....
Catalin Corp. of Amer.:							
Year, Dec. 31	*f*....	91,454	281,055	.17	.52	.....	.....
Columbian Carbon:							
Year, Dec. 31	*k*6.50	4,466,249	4,021,137	8.31	7.48	976,835	936,939
Compressed Industrial Gases:							
Year, Dec. 31	*w*.25	530,806	355,823	*h*2.06	*h*2.36	.....	.....
Consolidated Chemical Industries:							
Year, Dec. 31	§1.50	806,348	643.833	2.52	2.01	.....	.....
Corn Products Refining:							
Year, Dec. 31	*k*3.00	8,100,521	11,490,647	2.52	3.86	*d*1,209,645	282,981
Duval Texas Sulphur:							
Year, Dec. 31	*f*....	215,792	306,246	.43	.61	.....	.....
Fansteel Metallurgical:							
Year, Dec. 31	*f*....	120,044	161,056	.42	.63	.....	.....
Heyden Chemical:							
Year, Dec. 31	*y*2.50	612,324	555,540	3.94	3.56	.....	.....
International Nickel Canada:							
Dec. 31 quarter	*y*2.25	11,355,243	9,836,446	.74	.64	*d*61.859	3,521,704
Year, Dec. 31	*y*2.25	50,299,624	36,865,526	3.31	2.39	15,564,846	15,980,008
International Salt:							
Year, Dec. 31	§1.50	506,936	397,129	2.11	1.65	98,505	17,874
Lindsay Light & Chemical:							
Year, Dec. 31	*y*.10	30,291	26,809	.24	.18	.....	.....
McKesson & Robbins:							
Year, Dec. 31	....	3,667,325	3,286,614	1.60	1.32	.....	.....
Merck & Co.:							
Year, Dec. 31	*y*1.75	1,095,248	1,048,222	2.72	2.57	.....	.....
Monroe Chemical:							
Year, Dec. 31	*k*.50	93,749	188,577	.18	.93	.....	.....
Newport Industries:							
Year, Dec. 31	*x*2.00	1,154,069	507,009	2.22	.98	115,375	195,401
Pratt & Lambert:							
Year, Dec. 31	*y*1.75	488,829	455,922	2.52	2.35	.....	.....
Skelly Oil:							
Year, Dec. 31	*k*1.50	6,488,346	4,850,314	6.06	4.42	4,680,473	.....
Texas Gulf Sulphur:							
Year, Dec. 31	§2.00	11,589,281	9,853,014	3.02	2.56	1,029,281	253,014
U. S. Industrial Alcohol:							
Year, Dec. 31	*f*....	*z*484,813	†77,581	1.24	....	.....	.....
Vanadium Corp. of America:							
Year, Dec. 31	*k*1.00	836,657	152,193	2.22	.40	460,020	152,193
Victor Chemical:							
Year, Dec. 31	*w*.30	703,087	810,379	1.01	1.16	.....	.....

§ Plus extras; *d* Deficit; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; *k* Paid in year 1937; *f* No common dividend; *r* Year ended Dec. 31, 1936; † Net loss; *c* On combined Class A and Class B shares; *w* Last dividend declared; *h* On shares outstanding at close of respective periods; *x* For year ended May 31, 1937.

Dividends and Dates

Name	Div.	Stock Record	Payable
Abbott Labs., ext.	10c	Mar. 11	Mar. 31
Abbott Labs., q	40c	Mar. 11	Mar. 31
Abbott Labs., pf., q	$1.12½	Apr. 1	Apr. 15
Air Reduction, q	25c	Mar. 31	Apr. 15
Am. Agri. Chem.	$1.25	Mar. 14	Mar. 31
Am. Maize Prods., pf., q	$1.25	Mar. 15	Mar. 31
Am. Smelt. & Ref.	50c	May 6	May 31
Am. Smelt. & Ref., pf., q	$1.75	Apr. 8	Apr. 30
Am. Hard Rubber, 8% pf., q	$2.00	Mar. 15	Mar. 31
Borne-Scrymser	50c	Mar. 21	Apr. 15
Can. Indust., Ltd. A & B	$1.75	Mar. 31	Apr. 30
Can. Ind., pf., q	$1.75	Mar. 31	Apr. 15
Climax Molybdenum	30c	Mar. 18	Mar. 31
Colgate-Palmolive-Peet	(action deferred Jan. 26, '38)		
Colgate-Palmolive-Peet, pf., q	$1.50	Mar. 5	Apr. 1
Dom. Tar & Chem., pf., q	$1.37½	Apr. 12	May 2
Dow Chemical	75c	May 2	May 16
Dow Chemical, pf., q	$1.25	May 2	May 16
Du Pont, $4.50 pf.	$1.12½	Apr. 8	Apr. 25
Du Pont, deb., q	$1.50	Apr. 8	Apr. 25
Eagle Picher Lead, pf., q	$1.50	Mar. 10	Apr. 1
Eastman Kodak, q	$1.50	Mar. 5	Apr. 1
Eastman Kodak, pf., q	$1.50	Mar. 5	Apr. 1
General Printing Ink	10c	Mar. 18	Apr. 1
General Printing Ink., pf., q	$1.50	Mar. 18	Apr. 1
Glidden Co.	(No action Mar. 7, '38)		
Glidden Co., pf., q	56¼c	Mar. 17	Apr. 1
Gt. Western Electro Chem., pf., q	30c	Mar. 21	Apr. 1
Interchem. Corp.	(action deferred Jan. 15, '38)		
Int'l Nickel of Canada	50c	Mar. 1	Mar. 31
Int'l Nickel of Canada, pf., q	$1.75	Apr. 2	May 2
Int'l Salt, q	37½c	Mar. 15	Apr. 1
Koppers Co., 6% pf., q	$1.50	Mar. 12	Apr. 1
Mathieson Alkali, q	37½c	Mar. 5	Mar. 31
Mathieson Alkali, pf., q	$1.75	Mar. 5	Mar. 31
Mead Corp.	(no action Feb. 26, '38)		
Merck & Co.	(no action Mar. 17, '38)		
Monroe Chem., pf., q	87½c	Mar. 12	Apr. 1
Monsanto Chem., pf. A, semi-an.	$2.25	May 10	June 1
Nat'l Lead	12½c	Mar. 18	Mar. 31
Nat'l Lead, pf. B, q	$1.50	Apr. 22	May 2
Nat'l Oil Prods., interim	20c	Apr. 5	Apr. 15
Newport Industries	(no action Dec. 21, '37)		
Pittsburgh Plate Glass	25c	Mar. 10	Apr. 1
Procter & Gamble, 8%, pf., q	$2.00	Mar. 25	Apr. 15
Sherwin-Williams of Canada, pf.	$1.75	Mar. 15	Apr. 1
Skelly Oil, pf., q.	$1.50	Apr. 4	May 2
Std. Wholesale Phos., q	30c	Mar. 31	Apr. 15
Union Carbide	80c	Mar. 4	Apr. 1
United Dyewood	(no action Feb. 15, '38)		
United Dyewood, pf., q	$1.75	June 10	July 1
United Dyewood, pf., q	$1.75	Sept. 9	Oct. 1
United Dyewood, pf., q	$1.75	Dec. 9	Jan. 3
U. S. Smelt. & Ref.	$1.00	Apr. 1	Apr. 15
U. S. Smelt. & Ref., pf.	87½c	Apr. 1	Apr. 15

Outstanding Year for Columbian

Sales and earnings of Columbian Carbon in '37 were the largest in the history of the company, according to the annual report issued by F. F. Curtze, president. Net profit for the year ended on Dec. 31 amounted to $4,466,249 after deducting depreciation and depletion, minority interest and Federal taxes, including $33,539 estimated surtax on undistributed income. Profit is equivalent to $8.31 each on 537,406 no-par capital shares outstanding. Net profit in '36 was $4,021,137 after $8,136 surtax charge, or $7.48 a capital share.

Dunlop Rubber Co., Ltd.

Dunlop Rubber Company, Ltd., reports for '37: profit before taxes, £1,591,017, against £1,502,707 in '36; after transfer of £495,810 to taxation reserve, net profit for '37 was £1,095,202 before transfer of £250,000 to reserve for contingencies, as compared with net profit in '36 of £1,107,807 before transfer of £150,000 to reserve contingencies and £100,000 to general reserve.

Chemical Finances
Mar. 1938—p. 7

Chemical Finances
Mar. 1938—p. 8

Chemical Stocks and Bonds

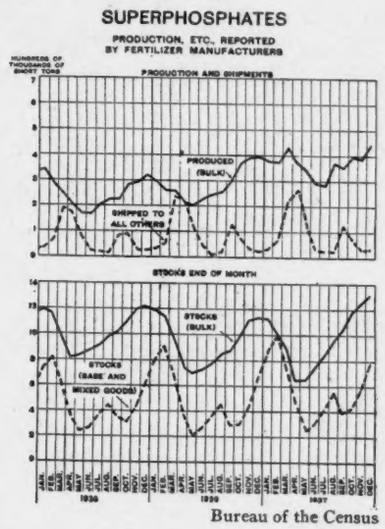
Mar. Last	1938 High	1938 Low	1937 High	1937 Low	1936 High	1936 Low	Sales	Stocks	Par $	Shares Listed	Dividends*	Earnings** $-per share-$ 1937	1936	1935
							Number of shares Mar. 1938	1938						
NEW YORK STOCK EXCHANGE														
40¼	58¼	40¼	80¼	44½	86½	58	33,500	75,900	Air Reduction	No	2,566,191	$3.00	2.86	2.79	2.05
125	176½	124	258½	145	345	157	13,300	39,200	Allied Chem. & Dye	No	2,214,099	7.50	11.19	11.44	8.71
50	66	49	101½	53½	89	49	1,500	4,500	Amer. Agric. Chem.	No	210,932	7.75	8.86	4.71	6.37
9½	13¾	9	30¾	8¾	35⅜	20½	8,200	19,700	Amer. Com. Alcohol	20	260,930	.50	3.23	4.55	3.16
21	30¼	21	46	22	50	37	1,100	4,000	Archer-Dan.-Midland	No	549,546	2.00	5.03	3.05	4.20
36	48	36	94	38	84	48	3,200	6,900	Atlas Powder Co.	No	248,145	2.25	4.40	4.21	2.81
105¼	119	105	133	101	131	112	370	640	5% conv. cum. pfd.	100	68,597	5.00	20.90	20.85	16.93
9⅛	18⅞	8	41¼	13	32¼	21¾	27,600	76,900	Celanese Corp. Amer.	No	1,000,000	2.25	2.04	2.33	1.99
94	94	92	115	90	116	106	.....	200	prior pfd.	100	164,818	7.00	27.07	27.25	35.34
7¼	11⅞	7⅛	25¾	8½	21¼	13	24,500	91,000	Colgate-Palm.-Peet	No	1,999,970	.50	.....	1.40	1.36
92	95½	92	104½	95	106½	100	1,000	4,900	6% pfd.	100	248,197	6.00	.....	17.13	16.79
55	76	55	125¾	65	136½	94	6,500	15,900	Columbian Carbon	No	537,406	6.50	8.31	7.48	5.56
6	10	5⅞	21¼	5	24⅝	14¼	37,200	119,300	Commercial Solvents	No	2,636,878	.60	.60	.85	1.02
53½	65½	53½	71¼	50½	82½	63⅝	17,400	44,800	Corn Products	25	2,530,000	3.00	2.52	3.86	2.62
163¾	166¼	163¾	171½	153	170	158	500	1,300	7% cum. pfd.	100	245,738	7.00	32.96	46.76	33.97
26	39¼	25	76⅛	29½	63	42	1,460	3,360	Devoe & Rayn. A	No	95,000	3.25	4.05	4.49	2.89
93	112	87⅞	159¼	79½	142¼	94⅛	10,100	20,600	Dow Chemical	No	945,000	3.35	4.17	4.48	3.29
94	123⅜	90½	180⅛	98	184¾	133	62,300	187,000	DuPont de Nemours	20	11,041,437	6.25	7.37	7.54	5.04
110	115¼	110	112	107½	.....	.....	3,100	7,600	4½% pfd.	No	500,000	4.50	165.48	.....	.....
130¾	137	130¾	135½	130	136½	129	700	3,700	6% cum. deb.	100	1,092,948	6.00	81.70	84.21	56.81
122	167	121½	198	144	185	156	10,100	31,800	Eastman Kodak	No	2,250,921	7.50	9.76	8.23	6.90
165	165½	157	164	150	166	152	60	730	6% cum.	100	61,657	6.00	362.45	306.64	258.09
20	28	19⅜	32¼	18	35⅝	23½	18,000	57,800	Freeport Texas	10	796,380	1.50	3.30	2.43	1.78
6¾	9⅞	6¾	19	8½	18	9½	6,300	27,200	Gen. Printing Ink	1	735,960	1.20	1.32	1.32	.97
13⅝	27¼	13	51½	19⅛	55¼	39½	15,100	48,600	Glidden Co.	No	800,060	2.60	.....	3.29	2.74
37½	51½	37½	58¼	43	56	52¼	800	2,500	4½% cum. pfd.	50	199,940	2.25	.....	15.43	13.23
80	95	80	117½	80½	133	99⅝	600	4,300	Hazel Atlas	25	434,474	6.56	6.67	6.55	7.58
42¾	58	42¾	92½	50	75	42	7,900	31,100	Hercules Powder	No	1,316,710	2.62	2.97	3.24	2.12
130	130	126¾	135½	125	135	126	410	710	6% cum. pfd.	100	96,194	6.00	50.75	48.97	36.30
14⅜	22	14⅜	47½	15	41⅜	25⅝	12,700	55,900	Industrial Rayon	No	759,325	2.00	.34	2.24	1.00
15	25	15	64¼	20	48	37	4,400	17,100	Interchem.	No	289,058	2.00	.....	3.02	2.21
83	95	83	111½	92	112	107	270	690	6% pfd.	100	66,917	6.00	.....	18.97	16.15
2	3⅞	2	9⅛	2	5⅞	2⅞	9,400	39,100	Intern. Agricul.	No	438,048	....	.16	—1.55	—.99
15¼	29	15	63½	18¼	47¾	22¾	2,100	8,300	7% cum. pr. pfd.	100	100,000	3.00	7.70	.23	2.69
38⅜	52¾	36⅞	73⅜	37	66⅜	43¼	220,900	697,100	Intern. Nickel	No	14,584,025	2.25	3.31	2.40	1.65
19½	22½	19½	28¾	19½	30	23	1,600	3,400	Intern. Salt	No	240,000	1.75	2.17	1.70	1.32
20	24	19¾	36	19¼	36¾	29¼	1,300	1,900	Kellogg (Spencer)	No	500,000	1.60	2.81	2.62	2.22
23½	42	23¼	79	33⅜	80¼	47¼	20,900	71,900	Libbey Owens Ford	No	2,506,117	4.00	4.19	4.14	3.26
12⅛	20	12⅛	26⅞	14	46½	32½	6,900	20,300	Liquid Carbonic	No	700,000	2.75	2.37	1.58	1.29
19¾	27½	19¾	41¾	22	42⅜	27½	8,800	16,800	Mathieson Alkali	No	828,191	1.65	1.81	1.76	1.44
68½	91½	68¼	107½	71	103	79	14,400	35,200	Monsanto Chem.	No	1,114,388	3.00	4.40	4.01	3.45
113¼	113¼	111	109	105	.....	.....	100	300	4½% pfd.	No	50,000	4.50	99.98	.....	.....
17⅛	29¾	17⅛	44	18	36½	26¾	41,600	105,400	National Lead	10	3,098,310	.50	.95	1.71	1.08
158½	159	158	171	153	171	155	400	800	7% cum. "A" pfd.	100	243,676	7.00	22.86	33.83	25.40
133	136	130¾	150	127	147	137¾	370	640	6% cum. "B" pfd.	100	103,277	6.00	43.77	74.50	49.05
10⅛	19¼	9⅞	41¾	10⅜	40	9	51,300	255,300	Newport Industries	1	519,347	.50	2.22	.98	.57
42	66½	40	103¾	51¼	82	64	21,800	76,500	Owens-Illinois Glass	12.50	2,661,204	4.00	3.51	3.80	2.09
39⅝	50⅝	39½	65½	43¼	56	40¼	16,300	48,400	Procter & Gamble	No	6,325,087	2.75	4.08	2.39	2.23
119	120⅛	117	118½	114½	122½	115¾	580	2,630	5% pfd.	100	169,517	5.00	157.05	94.14	88.15
10⅜	18¼	10	34¾	14⅞	28¾	14¾	21,900	51,000	Shell Union Oil	No	13,070,625	1.00	1.44	1.35	.37
93	101¾	93	105¾	91	127½	102	1,900	7,300	5½% cum. pfd.	100	379,798	5.00	..	65.49	17.92
18½	34¾	18½	60⅜	26½	47⅜	19½	8,200	27,700	Skelly Oil	No	1,006,348	1.50	6.07	4.42	2.17
84	93	84	102¼	88	132	97⅝	1,100	1,500	6% cum. pfd.	100	66,300	6.00	97.86	73.16	39.00
24¾	35½	24¾	50	26½	48½	32¾	46,300	120,500	S. O. Indiana	25	15,235,323	2.30	3.06	3.09	1.98
40¼	54⅛	39¾	76	42	70⅜	51⅝	96,100	316,800	S. O. New Jersey	25	26,224,767	2.50	.....	3.73	2.39
4¼	5¼	4¼	15¾	5¼	13	5⅝	13,700	34,400	Tenn. Corp.	5	853,696	.35	1.09	.41	.22
33⅛	44⅞	32⅝	65⅛	34⅜	55¼	28⅞	105,900	326,600	Texas Corp.	25	11,386,253	2.25	5.02	4.10	1.57
26½	34	26	44	23¾	44¾	33	12,400	47,400	Texas Gulf Sulphur	No	3,840,000	2.75	3.02	2.57	1.94
58½	80	57	111	61¼	105¼	71⅝	77,100	203,000	Union Carbide & Carbon	No	9,000,743	3.20	4.75	4.09	3.06
39⅞	49⅝	39	91	36¾	96¾	68	5,900	25,500	United Carbon	No	397,885	4.50	5.30	5.54	4.71
14	23¾	13½	43⅝	16⅞	59	31¼	11,500	35,400	U. S. Indus. Alc.	No	391,238	....	1.24	—.20	2.16
11½	20⅜	11½	39⅜	9¼	30⅝	16½	23,300	84,500	Vanadium Corp. Amer.	No	376,637	1.00	2.22	.40	—1.13
2¾	5½	2¾	12¾	2½	8½	4⅛	13,000	75,500	Virginia-Caro. Chem.	No	486,708	.....	—.05	—2.44	—.79
17	32⅛	15¾	74⅜	18½	58¾	28¾	11,200	48,100	6% cum. part. pfd.	100	213,392	1.50	5.88	.44	4.20
10	15½	10	27¼	10¾	32	19¾	2,600	7,200	Westvaco Chlorine	No	339,362	1.00	1.46	1.17	1.37
20	27	20	34⅞	21⅛	35¼	31¾	1,800	4,700	cum. pfd.	30	192,000	1.50	.....	3.26	3.22
NEW YORK CURB EXCHANGE															
15¾	26⅝	15½	37	17⅝	40¾	29¼	36,200	95,800	Amer. Cyanamid "B"	10	2,520,368	.60	2.09	1.77	1.61
65	82	65	124	69	116¼	99¾	175	750	Celanese, 7% cum. 1st pfd.	100	148,179	7.00	22.32	24.47	21.96
3	4½	3	15	3	16½	9	900	4,100	Celluloid Corp.	15	194,951	....	.....	—.80	—.95
12	12	12	14⅜	10½	15	11⅞	.....	100	Courtaulds' Ltd.	£1	24,000,000	9½%	....	8.40%	7.51%
7½	9¼	7¼	10⅜	3½	10¾	5	2,300	7,500	Duval Texas Sulphur	No	500,000	....	.43	.61	.16
27	37½	27	47½	31	55	39	1,000	1,500	Heyden Chem. Corp.	100	150,000	2.50	3.94	3.56	3.22
55	90	55	147½	77	140	98¼	9,600	24,000	Pittsburgh Plate Glass	25	2,142,443	6.50	8.53	7.15	5.32
68	90	68	154¾	72¼	154½	117	4,250	17,150	Sherwin Williams	25	633,927	6.00	8.44	8.04	6.19
110	110¼	107	114	106¼	116	110	120	400	5% cum. pfd.	100	137,139	5.00	44.01	41.44	33.17
PHILADELPHIA STOCK EXCHANGE															
129¾	149½	129¾	179	115	179	114¾	375	1,300	Pennsylvania Salt	50	150,000	8.75	11.79	8.57	5.94

Mar. Last	1938 High	1938 Low	1937 High	1937 Low	1936 High	1936 Low	Sales	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE							Mar. 1938	1938				
99⅛	104⅞	99⅛	109½	99	117½	107¾	208,000	675,000	Amer. I. G. Chem. Conv.	1949	5½	M-N	$25,300,000
25⅝	31	25⅛	42½	23	42½	27½	112,000	821,000	Anglo Chilean Nitrate inc. deb.	1967	4½-5	J	12,067,000
102⅞	105	102¾	102⅞	100⅛	.....	.....	21,000	146,000	Dow Chemical	1951	3	J-D	5,000,000
100	100¾	100	102	98½	102¾	96¾	32,000	83,000	Int. Agric. Corp. 1st Coll. tr. stpd. to 1942	1942	5	M-N	5,533,000
24¾	32⅜	24¾	35⅜	21¼	39	21	162,000	524,000	Lautaro Nitrate n inc. deb.	1975	4	J-D	30,500,000
22⅜	22⅜	20½	25½	20½	35	23½	.....	15,000	Ruhr Chem.	1948	6	A-D	1,500,000
97½	101¾	97½	102	93	101¼	94¼	497,000	1,440,000	Shell Union Oil	1951	3½	M-S	58,800,000
93	99½	93	102¾	94	102⅞	96⅜	126,000	420,000	Skelly Oil	1951	4	J-J	9,000,000
98	100	95	105	93½	105	103	26,000	65,000	Tenn. Corp. deb. "B"	1944	6	M-S	1,600,000
103¾	106⅜	103½	105¾	100	106	101½	311,000	1,012,000	Texas Corp.	1951	3½	J-D	60,000,000
79	88	79	111	81	98½	85¼	10,000	147,000	Vanadium Corp. conv.	1941	5	A-O	2,800,000

* Paid in 1937, including extras but excluding dividends paid in stock. ** For either fiscal or calendar years.

Production 30% Above '36

Superphosphate '37 production got back to the '28-'30 level, probably marking completion of an 8 year cycle. It has taken 5 years of recovery to raise production to pre-depression level. Sharpest increase during the 5 years was that of '37, when production was 30% higher than in '36, according to reports by acidulators to the N. F. A. In view of the prospective decline in fertilizer consumption in '38 some falling off in output of superphosphate this year would not be surprising.

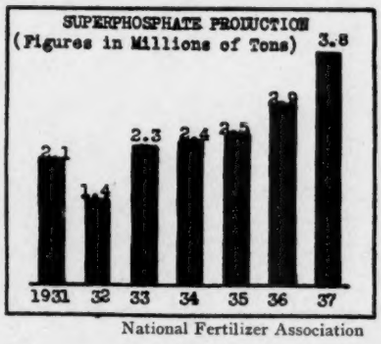


Bureau of the Census

Trend of production in '37 was sharply upward through June, with the 6-month output exceeding the first half of '36 by 53%. Increase in the second half-year was only 13%.

Consumption Back to '30 Level

All classes of superphosphate shipments were larger in '37 than in '36 according to reports of acidulators. Consumption of superphosphate increased less in '37 than did production, as there was a substantial rise in stocks during the year.



National Fertilizer Association

On the adjoining chart are pictured estimated changes in consumption of all fertilizers and of superphosphate in the 1930-1937 period. As would be expected,

SUPERPHOSPHATES SUMMARY, BY MONTHS, 1937, 1936*

Statistics relate to production, receipts, shipments, and stocks of superphosphates, based on data reported by 64 manufacturers, for months of 1937, and 66 manufacturers for months of 1936. These data include superphosphate of 16%, 32%, 45%, and other strengths, expressed throughout in equivalent short tons of 16% available phosphoric acid. The manufacturers whose data are included in these statistics produced approximately 95% of the total value of superphosphates in the U. S. Division line between the Northern and Southern areas is the south line of Virginia projected westward.

Production, Receipts, and Stocks (Short Tons)†

Year and Month	Production						Received from Other Acidulators (Including exchange transfers)‡				Stocks, End of Month					
	Bulk Superphosphate			Wet base and wet mixed goods			Bulk Superphosphate				Superphosphate			Base and mixed goods§		
	Total U. S.	Northern Area	Southern Area	Total U. S.	Northern Area	Southern Area	Total U. S.	Northern Area	Southern Area	Total U. S.	Northern Area	Southern Area	Total U. S.	Northern Area	Southern Area
January 1937	377,200	181,628	195,572	14,825	4,109	10,716	60,237	24,519	35,718	1,125,576	453,021	672,555	881,101	361,575	519,526
February	375,039	177,514	197,525	20,435	10,485	9,950	49,384	23,526	25,858	1,078,299	448,579	629,720	1,003,538	449,527	554,011
March	430,680	227,890	202,790	16,183	5,037	11,146	46,871	30,241	16,630	894,768	436,422	458,346	771,584	429,102	342,482
April	376,356	209,141	167,215	11,252	4,635	6,617	51,031	29,155	21,876	644,530	340,469	304,061	451,412	295,960	155,452
May	340,532	186,155	154,377	7,190	4,090	3,100	44,026	38,704	5,322	649,076	813,921	335,155	251,990	137,438	114,552
June	291,273	182,159	109,114	7,166	6,766	400	49,333	36,843	12,490	751,413	366,136	385,277	304,966	180,615	124,351
July	282,075	153,702	128,373	9,339	9,104	235	100,419	59,359	41,060	849,634	388,354	461,280	428,800	278,487	150,403
August	372,730	191,117	181,613	5,647	4,493	1,154	59,350	41,499	17,851	958,397	400,899	557,498	555,245	369,212	186,033
September	354,524	186,050	168,474	3,683	3,113	570	47,494	37,014	10,480	1,046,123	400,142	645,981	387,199	191,798	195,401
October	396,976	195,178	201,798	3,909	3,128	781	41,360	22,918	18,442	1,178,314	437,927	740,387	423,987	198,492	225,495
November	388,401	211,612	176,789	2,323	1,164	1,159	45,030	21,548	23,482	1,248,631	487,355	761,276	573,156	253,784	319,372
December	443,981	236,314	207,667	20,738	14,407	6,321	56,079	33,125	22,954	1,313,327	523,585	789,742	784,532	362,840	421,692
Total (Year)	4,429,767	2,338,460	2,091,307	122,680	70,531	52,149	650,614	398,451	252,163	.....	.....	.....	.....	.....	.....
January 1936	298,073	155,168	142,905	14,072	7,997	6,075	51,842	29,821	22,021	1,190,315	495,021	695,294	805,256	343,825	461,431
February	259,374	132,690	126,684	13,581	7,741	5,840	37,982	16,041	11,941	1,137,700	494,397	643,303	911,449	406,591	504,858
March	257,723	158,242	99,486	12,667	5,521	7,146	47,884	23,492	24,392	953,739	468,943	484,796	694,202	364,933	329,269
April	216,558	133,272	83,286	7,598	5,154	2,444	59,122	44,583	14,539	742,105	390,295	351,810	384,621	240,754	143,867
May	203,945	123,033	80,912	8,792	7,197	1,595	49,497	36,647	12,850	702,335	347,541	354,794	212,786	119,464	93,322
June	225,485	149,868	75,617	12,796	10,682	2,114	40,121	34,243	5,878	721,243	359,932	361,311	262,312	158,849	103,463
July	243,162	150,378	92,784	8,327	6,816	1,511	44,624	38,180	6,444	770,790	370,063	400,727	362,677	242,042	120,635
August	256,792	128,332	128,460	13,038	11,563	1,475	26,794	18,834	7,960	845,381	370,441	474,940	454,245	308,792	145,453
September	299,065	132,271	166,794	9,103	6,661	2,442	34,061	25,374	8,687	876,563	316,696	559,867	292,272	131,494	160,778
October	369,335	162,684	206,651	14,282	6,316	7,966	45,528	30,090	15,438	985,632	343,019	642,613	295,241	106,893	188,348
November	389,369	187,884	201,485	10,768	7,536	3,232	66,889	39,579	27,310	1,117,011	412,378	704,633	437,824	171,151	266,673
December	393,600	191,239	202,361	17,435	10,285	7,150	62,530	28,275	34,255	1,133,640	430,222	703,418	657,828	260,478	397,350
Total (Year)	3,412,486	1,805,061	1,607,425	142,459	93,469	48,990	550,874	359,459	191,415	.....	.....	.....	.....	.....	.....
Total (Year) 1935	2,954,130	1,587,670	1,366,460	109,609	67,156	42,453	446,599	284,675	161,924	.....	.....	.....	.....	.....	.....

* Source: Dept. of Commerce, Bureau of the Census. † Net Book Adjustments (Account of Inventories) for 1937 were —17,191; for 1936, + 7,943; for 1935, + 7,211. ‡ Includes both bulk superphosphate and base and mixed goods. § Includes wet and dry bases and wet and dry mixed goods.

Fertilizer & Fertilizer Materials, 1937

Superphosphate Statistics—p. 9

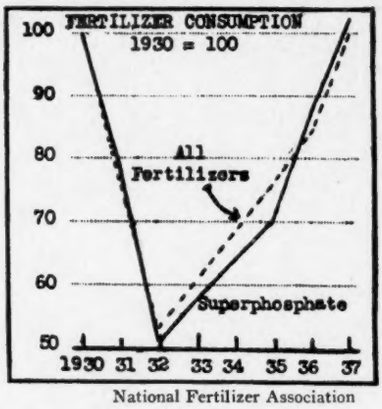
SUPERPHOSPHATES SHIPMENTS (Short Tons)*

All Superphosphate

Year and Month	Total U. S.	Total Northern Area	Total Southern Area	To Mixers Total U. S.	To Mixers Northern Area	To Mixers Southern Area	To Other Acidulators (Including exchange transfers) Total U. S.	To Other Acidulators (Including exchange transfers) Northern Area	To Other Acidulators (Including exchange transfers) Southern Area	To All Others Total U. S.	To All Others Northern Area	To All Others Southern Area	Base and Mixed Goods† Total U. S.	Base and Mixed Goods† Northern Area	Base and Mixed Goods† Southern Area
January 1937	204,048	88,914	115,134	90,117	44,238	45,879	78,908	35,220	43,688	35,023	9,456	25,567	45,429	7,503	37,926
February	248,030	98,248	149,782	137,570	60,539	77,031	41,628	19,954	21,674	68,832	17,755	51,077	115,930	23,857	92,073
March	466,835	182,430	304,405	175,374	80,112	95,262	93,302	43,034	50,268	218,159	59,284	158,875	421,096	112,755	308,341
April	552,999	288,769	294,230	252,667	145,976	106,691	67,254	33,790	33,464	263,078	109,003	154,075	422,032	183,055	238,977
May	326,375	225,222	101,153	159,903	106,005	53,898	52,043	33,502	18,541	114,429	85,715	28,714	257,241	182,765	74,476
June	160,979	104,517	56,462	91,390	60,000	31,390	38,341	25,737	12,604	31,248	18,780	12,468	34,605	24,431	10,174
July	140,042	81,922	58,120	85,449	47,390	38,059	29,018	21,495	7,523	25,575	13,037	12,538	25,615	19,436	6,179
August	166,573	101,487	65,086	95,438	61,564	33,874	45,211	17,171	28,040	25,924	22,752	3,172	38,665	33,094	5,571
September	270,200	201,163	69,037	113,324	74,286	39,038	31,004	19,705	11,299	125,872	107,172	18,700	206,795	193,342	13,453
October	208,159	129,561	78,598	98,152	70,392	27,760	39,307	23,746	15,561	70,700	35,423	35,277	45,876	31,107	17,460
November	182,555	115,679	66,876	84,934	57,843	27,091	65,969	38,445	27,524	31,652	19,391	12,261	51,640	31,107	20,533
December	200,399	114,463	85,936	114,287	71,782	42,505	50,270	18,986	31,284	35,842	23,695	12,147	41,206	20,151	21,055
Total (Year)	3,177,194	1,732,375	1,444,819	1,498,605	880,127	618,478	632,255	330,785	301,470	1,046,334	521,463	524,871	1,723,590	877,372	846,218
January 1936	163,798	82,842	80,956	98,663	59,294	39,369	31,972	14,239	17,733	33,163	9,309	23,854	41,569	8,061	33,508
February	174,900	81,428	93,472	93,461	48,082	45,379	26,752	17,390	9,362	54,687	15,956	38,731	73,456	13,688	59,768
March	450,418	174,007	276,411	157,625	85,076	72,549	54,295	33,838	20,457	238,498	55,093	183,405	368,988	80,263	188,725
April	424,372	217,664	206,708	150,764	91,902	58,862	54,268	42,350	11,918	219,340	83,412	135,928	381,342	167,856	213,486
May	256,312	184,638	71,674	88,954	68,846	20,108	47,746	35,646	12,100	119,612	80,146	39,466	212,065	140,296	71,769
April	146,059	102,478	43,581	72,824	57,815	15,009	27,418	15,642	11,776	45,817	29,021	16,796	60,678	39,424	21,254
June	104,366	77,119	27,247	61,067	48,113	12,954	33,789	21,480	12,309	9,510	7,526	1,984	42,681	25,114	17,567
July	104,068	75,243	28,825	44,492	36,795	7,697	38,463	21,516	16,947	21,113	16,932	4,181	27,495	16,413	11,082
August	257,575	196,523	61,052	61,566	46,601	14,965	68,631	43,687	24,944	127,378	106,235	21,143	215,450	198,836	16,614
September	229,146	136,671	92,475	88,568	64,687	23,881	68,324	30,062	38,262	72,254	41,922	30,332	86,235	59,613	26,622
October	164,479	85,428	79,051	72,777	48,035	24,742	59,565	25,992	33,573	32,137	11,401	20,736	28,246	16,172	12,074
November	193,567	101,970	91,597	93,174	53,867	39,307	76,891	38,970	37,921	23,502	9,133	14,369	42,514	19,888	22,626
December															
Total (Year)	2,669,060	1,516,011	1,153,049	1,083,935	709,113	374,822	588,114	340,812	247,302	997,011	466,086	530,925	1,480,719	785,624	695,095
Total (Year) 1935	2,047,309	1,179,855	867,454	856,955	561,223	295,732	366,177	210,761	155,416	824,177	407,871	416,306	1,354,728	693,798	660,930

* Source: Dept. of Commerce, Bureau of the Census. † Includes wet and dry bases and wet and dry mixed goods.

the two move in much the same way. In the early period of recovery superphosphate apparently lagged somewhat

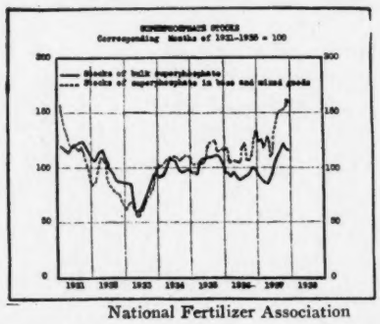


National Fertilizer Association

but in the past 2 years the rate of gain has been greater than in total consumption. The marked increase in '36 and '37 probably reflects in part effect of the Soil Conservation Program and increasing attention given to pasture and hayland fertilization.

Stock Up 20%

Although production in the early part of '37 was increasing at a rapid rate there



National Fertilizer Association

was no piling up of stocks as demand was more than sufficient to absorb large output. Stocks, in fact, showed a more than seasonal decline. From early summer on, however, there was indication of accumulation of stocks. At the close of the year inventories were the largest for any year-end in at least 7 years. Figures on stocks as of Dec. 31 of the past 7 years are given below:

Year	Stocks of Bulk Superphosphate	Stocks of Superphosphate in Base and Mixed Goods	Total Stocks
1931	1,089,000	430,000	1,518,000
1932	891,000	297,000	1,188,000
1933	929,000	440,000	1,368,000
1934	971,000	497,000	1,468,000
1935	1,014,000	554,000	1,568,000
1936	941,000	594,000	1,535,000
1937	1,135,000	710,000	1,845,000

The '38 outlook, unfortunately, is such that it is extremely unlikely that the excellent consumption record of '37 will be duplicated during '38. With large stock accumulations to be worked off and a drop in fertilizer use expected, superphosphate producers do not look forward to '38 with much enthusiasm.

Fertilizer & Fertilizer Materials, 1937

Exports, Imports, World '36 Superphosphate Trade—p. 10

Exports Down 8%; Imports Up 34%

Exports of fertilizers and fertilizer materials from the U. S. in '37 totaled 1,703,465 short tons with a stated valuation of $16,954,367, according to a compilation by The National Fertilizer Association from the records of the Dept. of Commerce. This represented decreases of 8% in tonnage and 5% in value from '36. Declines from '36 to '37 were common to most commodity groups, with ammonium sulfate and phosphate rock falling off the most sharply. Declines in exports of synthetic sodium nitrate and potash were slight.

Imports rose last year to the highest point reached since '29. Totaling 2,344,511 short tons valued at $46,725,286, they exceeded '36 by 34% in volume and 33% in dollar value. Moderate increases took place in imports of nitrogenous materials and phosphates while there was a much sharper rise in potash salt imports. In the nitrogenous group a large decrease in ammonium sulfate was more than offset by larger imports of sodium nitrate. Net imports (imports less exports) of ammonium sulfate in '37 amounted to 10,009 tons against 53,190 tons in '36. All classes of phosphates were brought in in larger quantity in '37 than in '36. There were substantial increases over the preceding year in imports of muriate of potash, 20% kainite, and sulfate of potash.

Superphosphate World Trade, 1936

In Metric Tons

Country	Production	Imports	Exports
Europe	8,162,318	451,105	734,765
Austria	44,280	112	.....
Belgium	288,000	26,497	175,017
Czechoslovakia	159,507	.....	84
Denmark	357,800	10,148	6,472
Estonia	.....	28,199	.....
Finland	6,368	23,372	.....
France	1,388,517	55,727	28,017
Germany[1]	950,000	58,615	37,062
Gr. Britain & Ireland[3]	587,410	32,863	17,448
Greece	78,607	12,712	14,902
Netherlands	474,415	50,061	389,624
Hungary	69,300	.....	.....
Italy	1,365,956	.....	1,856
Yugoslavia	21,466	.....	23
Latvia	72,090	9,898	.....
Lithuania	19,000	46,157	.....
Norway	20,290	49,238	120
Poland	124,607	70	16,645
Portugal	182,000	11,000	.....
Rumania	3,737	.....	.....
Soviet Union[2]	1,256,000	.....	32,762
Spain[3]	460,000	.....	.....
Sweden	213,474	31,947	14,733
Switzerland	19,494	4,489	.....
Africa	220,218	214,323	19,243
Egypt	.....	86,657	.....
N. Africa[7]	80,104	25,525	19,243
S. Africa	140,114	102,141	.....
America	3,892,039	105,835	72,364
Canada[5]	40,779	87,146	7,982
Uruguay	1,260	.....	.....
United States[1]	3,850,000	18,689	64,382
Asia: Japan[4]	1,800,636	.....	26,352
Oceania	1,534,912	3	1,890
Australia[6]	1,128,088	3	1,890
New Zealand[6]	406,824	.....	.....
Other Countries[9]	11,500	106,740	.....
Grand Total:			
1936	15,621,623	878,006	854,614
1935	14,448,487	796,999	813,138

[1] Estimate. [2] 18.6 per cent. Equivalent to 1,673,000 T. of 14 per cent. [3] Estimate based on exports of phosphate rock to Spain. [4] Includes production in Formosa & Korea and phosphoric acid content of compounds. [5] Year ended June 30, 1936. [6] Year ended June 30, 1937. [7] Tunis, Algeria & Morocco, exclusive of interchange trade. [8] Excluding exchange trade between Gr. Britain and Ir. Fr. State. [9] Details for certain countries, available in Chemical Division.

COMPARISON BY MONTHS, 1937, 1936; EXPORTS OF FERTILIZER AND FERTILIZER MATERIALS*

Month	1937 Exports Quantity	1937 Exports Dollars	1936 Exports Quantity	1936 Exports Dollars
January	61,002	635,580	164,458	2,033,693
February	59,286	770,520	149,917	1,639,258
March	106,297	1,194,488	178,789	2,064,421
April	122,863	1,355,694	117,628	1,347,140
May	166,234	1,408,479	144,811	1,812,005
June	120,301	1,670,813	101,923	905,039
July	150,583	1,735,071	151,082	1,503,851
August	151,204	1,653,071	126,899	1,266,268
September	111,901	1,549,832	150,753	1,434,888
October	178,734	1,736,048	173,426	1,969,970
November	152,388	1,951,745	123,609	1,357,115
December	.....	.....	68,721	673,298
Total	.....	.....	1,648,809	17,750,489

* Source: Monthly Summary of Foreign Commerce.

COMPARISON BY MONTHS, 1937, 1936; IMPORTS OF FERTILIZER AND FERTILIZER MATERIALS*

Month	1937 Imports Quantity	1937 Imports Dollars	1936 Imports Quantity	1936 Imports Dollars
January	196,461	4,225,546	146,477	2,924,360
February	230,530	5,097,070	214,933	4,471,233
March	253,806	5,586,871	168,459	3,639,617
April	248,328	5,473,184	184,079	3,843,394
May	176,659	3,916,221	135,924	2,871,091
June	119,153	2,616,496	72,153	1,521,611
July	77,060	2,002,388	60,603	1,386,004
August	110,435	2,836,046	60,599	1,444,753
September	136,586	3,310,650	67,582	1,653,208
October	152,919	3,688,606	163,274	3,759,939
November	150,657	3,633,493	95,617	2,391,282
December	.....	.....	158,195	3,487,446
Total	.....	.....	1,519,694	33,393,827

* Source: Monthly Summary of Foreign Commerce.

Ammonium Sulfate Exports, 1937

Country	Tons	Value
Spain	23,937	$552,300
Canada	2,485	66,118
Honduras	1	34
Nicaragua	6	213
Panama	1	33
Salvador	1	120
Mexico	234	5,913
Jamaica	96	2,147
Other British W. I.	1,553	41,230
Cuba	2,908	59,463
Dominican Republic	32	915
French W. I.	2	76
Haiti, Republic of	8	272
Argentina	661	17,194
Brazil	7	228
Venezuela	28	987
British India	250	3,468
British Malaya	1,376	41,511
China	560	14,000
Netherland India	18,022	414,385
Hong Kong	242	6,837
Persia	1,414	35,889
Philippine Is.	22,372	603,332
Other Asia	1	17
French Oceania	1	37
Union of So. Africa	5,431	130,165
Mozambique	44	1,018
Canary Is.	1,113	16,000
Total	82,786	$2,013,902

Fertilizer & Fertilizer Materials, 1937
Exports, Imports, World '36 Superphosphate Trade—p. 10

Fertilizer & Fertilizer Materials, 1937

Exports, Imports by Months—p. 11

U. S. EXPORTS AND IMPORTS OF FERTILIZERS AND FERTILIZER MATERIALS BY CLASSES BY MONTHS 1937*

EXPORTS	January	February	March	April	May	June	July	August	September	October	November	December	1937	1936	1935
Ammonium sulfate	474	304	581	12,359	8,216	4,483	10,138	9,498	7,607	10,447	15,103	3,575	82,786	118,476	87,837
Other nitrogenous materials†	7,001	14,715	23,324	3,003	7,269	8,689	8,669	8,063	18,440	20,039	11,397	7,287	137,769	139,821	153,148
Nitrogenous organic wastes	1,492	2,235	2,336	1,964	1,944	1,155	1,354	1,336	1,679	1,951	1,461	1,531	20,278	16,057	13,659
TOTAL NITROGENOUS MATERIALS	8,967	17,254	26,241	17,326	17,429	14,327	20,161	18,897	27,726	32,437	27,961	12,393	240,833	274,354	254,644
High grade hard rock	0	6,038	23,657	7,967	11,636	11,752	13,914	18,815	13,300	8,986	19,987	2,414	134,935	174,497	145,382
Sand pebble rock	50,272	36,310	59,797	94,595	144,381	78,248	112,326	108,740	69,382	127,169	75,882	111,787	1,044,203	1,179,528	1,091,539
TOTAL PHOSPHATE ROCK	50,272	42,348	82,854	102,562	156,017	90,000	126,240	127,555	82,682	136,155	95,869	114,201	1,179,138	1,354,025	1,236,921
Superphosphate	4,732	2,574	3,565	6,180	2,821	4,288	4,299	10,974	805	18,576	21,130	8,478	88,423	76,572	61,562
Other phosphate materials	256	346	265	324	243	524	111	1,577	405	7,940	8,271	8,625	62,345	3,908	4,462
TOTAL PHOSPHATE MATERIALS	55,260	45,268	86,684	109,066	159,081	94,812	130,650	140,106	83,892	162,671	125,270	131,304	1,329,906	1,434,505	1,302,945
POTASH FERTILIZERS	1,431	2,818	4,255	9,712	8,642	21,496	15,009	6,251	10,239	3,276	15,378	4,525	103,031	104,023	75,983
Concentrated chemical fertilizers	2,470	924	1,622	999	558	3,825	1,818	3,756	3,330	1,439	1,696	3,058	25,494	28,587	22,505
Prepared fertilizer mixtures	194	137	251	504	472	277	1,016	339	142	359	371	114	4,201	5,197	6,094
GRAND TOTAL	68,322	66,401	119,053	137,607	186,182	134,737	168,654	169,349	125,329	200,182	170,676	151,394	1,703,465	1,846,666	1,662,171
IMPORTS															
Ammonium sulfate	720	18,165	6,306	7,456	7,271	7,078	11,018	7,146	4,752	3,075	13,339	6,419	92,795	171,666	88,549
Ammonium nitrate mixtures	3,685	5,228	11,855	9,285	3,023	0	309	2,240	8,785	12,425	9,950	7,605	74,390	62,149	35,315
Calcium cyanamid	13,691	22,888	30,240	12,613	6,791	8,108	5,960	4,319	5,613	6,557	9,799	11,648	138,227	126,407	112,261
Calcium nitrate	600	12,479	3,170	6,108	5,273	1,083	2,067	675	1,207	2,134	3,436	7,252	45,485	41,394	25,920
Guano	277	319	7,622	1,922	1,730	1,204	408	281	298	328	102	186	14,676	25,540	18,165
Dried blood	622	962	2,109	1,519	1,446	1,740	936	1,163	1,388	492	798	562	13,736	11,283	10,101
Sodium nitrate	58,949	118,396	109,737	153,449	95,336	58,887	3,098	2,089	6,132	3,216	23,966	62,644	704,247	529,015	437,690
Urea and calurea	170	123	349	293	118	26	291	494	128	158	388	162	2,699	3,620	4,495
Ammonium phosphates	314	7,046	3,988	6,105	2,670	1,253	2,594	1,224	1,113	1,431	1,683	1,101	30,523	14,988	12,109
Tankage	3,193	2,998	8,911a	7,578b	6,340c	5,209d	6,119	7,168e	7,492f	4,880g	4,409h	4,088i	69,762	53,943	34,553
Castor bean pomace	282	1,790	0	1,655	3,112	56	1,180	3,901	248	2,461	785	400	15,870	22,358	22,312
Fish scrap and meal	.....	.....	1,971	5,320	2,839	6,978	2,741	251	1,652	423	0	272	27,516	.....	.....
Other nitrogenous materials	7,672	25,599	16,701	11,735	7,541	11,766	9,125	10,756	7,002	7,848	8,024	9,517	117,849	91,343	73,478
TOTAL NITROGENOUS MATERIALS	90,175	215,993	202,959	225,038	143,490	103,388	45,896	41,707	45,810	45,428	76,679	111,856	1,347,775	1,153,706	874,948
Bone phosphates	3,004	3,773	7,562	4,467	3,815	5,258	3,812	2,647	4,193	2,652	3,821	1,761	46,766	30,276	21,123
Superphosphate—not over 20%	2,984	678	3,991	2,306	3,107	6,833	5,275	1,810	3,021	9,363	5,529	1,460	46,357	16,803	17,992
Superphosphate—over 20%	262	213	5,868	1,725	440	3,022	199	150	2,356	0	499	0	14,734	2,511	3,724
Superphosphate—ammoniated	0	0	0	136	10	216	545	25	0	1,906	558	395	3,790	1,288	1,293
Phosphate rock	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other phosphates	0	0	222	180	7,157	0	6	0	0	8,019	112	112	15,808	4,321	5,350
TOTAL PHOSPHATE MATERIALS	6,250	4,664	17,643	8,814	14,529	15,329	9,837	4,632	9,570	21,940	10,519	3,728	127,455	55,199	49,482
Muriate of potash	72,020	16,489	32 630	11,968	8,851	4,665	20,004	42,302	52,066	62,657	36,051	56,384	417,682	235,959	262,370
Kainite, 14%	0	0	0	353	0	600	0	0	21	0	0	0	974	1,616	1,845
Kainite, 20%	26,622	1,874	5,744	10,929	2,708	2,445	1,653	4,276	20,366	15,052	13,117	24,263	129,051	57,675	81,043
Manure salts, 30%	5,316	1,307	7,441	4,403	650	1,004	203	5.517	4,535	2,806	3,967	7,762	44,909	39,053	95,563
Sulfate of potash	12,519	2,882	10,465	3,656	2,527	1,182	1,652	13,294	13,459	11,993	8,832	11,958	94,420	59,578	70,820
Sulfate of potash, magnesia	2,694	227	1,003	652	15	0	0	3,215	5,445	2,361	4,088	2,576	22,275	13,610	25,876
Nitrate of potash	6,180	14,564	1,809	1,236	864	550	318	781	1,589	539	6,409	1,474	17,162	65,941	45,257
Potash-sodium nitrate mixtures	.....	.....	2,670	3,641	0	347	8,730	7,999	724	9,827	5,752	100	58,921	.....	.....
Other potash	9	8	54	67	56	11	21	1	9	2	7	10	255	279	272
TOTAL POTASH MATERIALS	125,360	37,351	61,816	36,905	15,671	10,804	32,581	77,385	98,194	105,237	78,223	104,527	785,649	473,711	583,046
Nitrate-phosphate-potash fertilizers	166	865	1,928	1,505	1,109	71	136	582	253	509	1,492	899	9,514	5,864	2,696
Other fertilizers	1,279	2.320	7,105	11,104	24,704	7,589	2,236	5,571	4,926	1,605	5,416	1,228	74,118	67,520	63,532
GRAND TOTAL	223,230	261,193	291,451	283,366	199,503	137,181	90,686	129,877	158,753	174,719	172,329	222,238	2,344,511	1,756,000	1,573,704

* Source: Digested from the monthly reports of the National Fertilizer Association; † Chiefly domestic synthetic sodium nitrate; a Includes 7,188 short tons for non-fertilizer use; b 5,238 tons, see a; c 3,855 tons, see a; d 3,730 tons, see a; e 6,189 tons, see a; f 5,777 tons, see a; g 3,450 tons, see a; h 3,593 tons, see a; i 3,264 tons, see a.

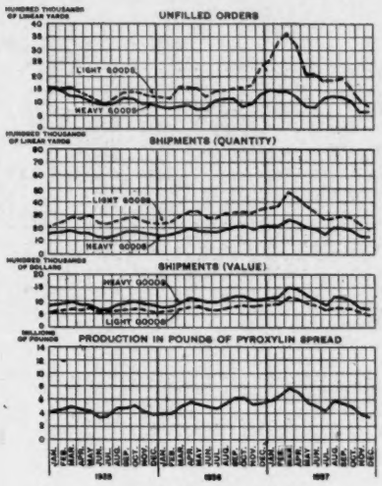
Pyroxylin-Coated Textiles

Monthly statistics relating to pyroxylin-coated textiles, based on data from 20 manufacturers comprising almost the entire industry, for the years 1937 and 1936 and the totals for 1935, are given in the table below. The data include products manufactured by spreading nitro-cellulose or pyroxylin preparations, either by themselves or in combination with other materials, upon grey goods, such as sheetings, drills, sateens, and moleskins. The classification "Light goods," as used in this report, refers to sheetings, and "Heavy goods," to drills, sateens, broken twills, ducks, and moleskins. Data are gathered by the Bureau of the Census.

Cellulose Plastics

Monthly statistics for the years 1937 and 1936 and totals for the years 1937, 1936, and 1935 on production, shipments, and consumption of cellulose plastic products are given in the table on the next page. Data are based on the reports of 10 manufacturers for the months of 1937 and 1936, and January to May 1935, and of 11 manufacturers from June to December, 1935, and represent practically the entire industry. Statistics are prepared by the Bureau of the Census.

PYROXYLIN-COATED TEXTILES



Bureau of the Census

The past year saw a substantial gain in the production of pyroxylin-coated textiles despite sharp curtailment in the last few months. Total linear yards of light goods amounted to 38,377,051, as compared with 35,913,618 in '36 and 30,527,939 in '35; total heavy goods in '37 was 23,254,214 linear yards, as compared with 21,807,010 in '36 and 19,061,072 in '35. Just one comparison is sufficient to indicate how sharply production fell in the last few months of '37. Production of light goods in December of the past year amounted to only 1,890,806 linear yards, as compared with 3,423,170 in the corresponding period of the previous year. Monthly production for the first 6 months of '37 showed substantial gains over the same months of '36, but in the last half of the year the situation was just the reverse.

Sharp Decline in Production

While the total figures for '37 production of cellulose plastics of all types showed gains from the '36 and '35 figures, the production figures for the last few months of the year make a sorry comparison with the corresponding months of the previous year. December production of nitrocellulose sheets, for example, totaled only 412,887 lbs., as compared with 1,054,662 lbs. in December of '36.

PYROXYLIN-COATED TEXTILES
Summary for 1937, 1936*

Year and Month	Light Goods: Shipments: Linear yards	Light Goods: Shipments: Value	Light Goods: Unfilled orders† (Linear yards)	Heavy Goods: Shipments: Linear yards	Heavy Goods: Shipments: Value	Heavy Goods: Unfilled orders† (Linear yards)	Pyroxylin spread‡ (Pounds)
January 1937	3,515,383	$857,353	2,624,404	2,102,800	$1,162,096	1,485,159	5,964,572
February	3,664,189	889,254	3,303,549	2,142,082	1,162,402	1,427,190	6,498,204
March	4,769,506	1,131,224	3,684,661	2,642,703	1,509,959	1,422.112	7,803,471
April	4,314,429	1,068,680	3,167,594	2,451,581	1,432,206	1,246,606	7,155,521
May	3,664,620	912,292	2,032,950	2,062,580	1,197,560	842,766	5,555,434
June	3,146,915	816,639	2,082,970	1,870,658	1,016,261	803,249	4,957,803
July	2,631,155	656,387	1,835,714	1,489,980	877,961	1,188,656	4,316,537
August	2,778,419	746,697	1,864,420	2,025,340	1,171,500	1,252,847	5,981,611
September	2,956,369	756,848	1,944.843	2,005,416	1,154,578	1,234,382	5,481,218
October	2,788,158	702,690	1,512,893	1,828,913	1,009,909	1.071,281	4,944,517
November	2.257,102	576,741	1,098,540	1,351,823	704,180	632,158	3,762,146
December	1,890,806	465,789	887,324	1.280,338	683,888	656,875	3,365,894
Total (Year)	**38,377,051**	**9,580,594**	.....	**23,254,214**	**13,082,500**	.....	**65,786,928**
January 1936	2,336,068	576,287	1,218,120	1,379,131	783,102	815,145	3,951,271
February	2,405,915	593,542	1,128,831	1,469,630	789,744	813,739	3,894,468
March	2,988,546	695,615	1,584,834	1,700,730	944,370	890,507	5,120,607
April	3,183,665	764,730	1,560,730	1,934,331	1,093,727	898,295	5,647,004
May	3,236,929	795,380	1,530,574	1,776,011	1,014.180	742,579	5,422,538
June	2,870,782	700,175	1,224,091	1,737,546	973,282	776,176	4,930,125
July	2,800,979	680,266	1,428,430	1,699,786	954,334	1,031.602	4,685,821
August	3,069,913	757,088	1,485,300	1,902,106	1,081,129	1,127,036	5,374,978
September	3,156,414	792,237	1,534,216	2,075,386	1,174,619	1,133,785	6,086,557
October	3,241,972	834,687	1,574,046	2,166,053	1,173,585	836,358	6,080,964
November	3,199,265	795,768	1,695,798	1,894,251	1,031,427	988,401	5,320,813
December	3,423,170	826,115	2,305,972	2,072,049	1,063,723	1,327,469	5,648,328
Total (Year)	**35,913,618**	**8,811,890**	.....	**21,807,010**	**12,077,222**	.....	**62,163,474**
Total (Year) 1935	**30,527,939**	**7,526,677**	.....	**19,061,072**	**10,303,533**	.....	**51,564,405**

* Source: Dept. of Commerce, Bureau of the Census. † Orders on hand at the close of the current month (reported in yards only) exclusive of contracts with shipping dates unspecified. ‡ Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly.

Cellulose Plastics

Cellulose Production—p. 2

CELLULOSE PLASTIC PRODUCTS*

(Nitro-cellulose and cellulose-acetate sheets, rods and tubes)

Production, Shipments, and Consumption in Reporting Company Plants (lbs.)

Year and Month	Nitro-Cellulose								Cellulose Acetate			
	Sheets		Rods		Tubes		Sheets, Rods and Tubes Consumed in reporting company plants		Sheets, Rods, and Tubes			
	Production	Shipments†	Production	Shipments†	Production	Shipments†			Production	Shipments†	Consumed in reporting company plants	
January 1937	1,342,760	1,199,169	281,539	300,368	90,187	61,609	279,266		853,376	742,380	11,260	
February	1,557,356	1,301,177	347,783	317,594	71,065	68,696	342,067		1,269,775	1,396,509	8,870	
March	1,362,819	1,239,487	343,841	321,558	87,901	78,329	295,349		1,621,103	1,764,311	11,079	
April	1,239,686	1,174,223	347,078	358,330	105,171	95,570	324,283		1,410,637	1,313,175	6,561	
May	1,237,034	1,072,196	297,904	315,409	91,860	62,086	336,084		1,170,106	1,098,812	7,552	
June	1,164,875	1,234,223	292,784	294,391	78,549	71,112	338,117		1,112,603	1,042,937	9,459	
July	1,019,657	992,918	193,791	330,996	67,607	72,425	250,268		830,922	887,938	10,896	
August	1,256,363	1,203,266	300,663	288,360	85,292	66,649	340,243		1,416,253	1,466,693	13,037	
September	1,146,391	1,239,549	242,412	365,340	116,956	87,017	271,860		1,223,848	1,102,419	13,544	
October	1,018,760	1,109,000	174,950	258,351	89,760	102,257	282,955		919,432	962,702	8,154	
November	824,170	736,726	185,891	158,721	56,957	82,920	239,775		782,929	678,319	15,867	
December	412,887	514,027	148,889	139,682	40,701	46,257	136,192		624,078	602,887	8,621	
Total (Year)	13,582,778	13,015,961	3,157,525	3,449,100	982,006	894,927	3,436,459		13,235,062	13,059,082	124,900	
January 1936	966,166	993,420	208,345	208,989	55,378	49,292	229,529		869,498	934,228	24,591	
February	1,071,742	887,752	179,513	204,067	70,269	56,243	218,556		596,898	545,691	26,684	
March	922,034	949,336	218,971	230,837	83,062	58,487	233,482		784,852	938,609	26,909	
April	1,109,169	1,056,627	224,130	206,199	55,154	56,619	249,843		1,221,442	1,096,612	23,846	
May	1,089,241	1,049,970	198,005	187,574	57,330	50,822	235,436		980,101	920,650	20,692	
June	889,770	966,767	198,226	185,206	65,580	53,752	250,363		1,061,348	849,701	17,928	
July	979,434	965,488	181,222	167,423	64,126	65,281	190,743		1,001,506	745,812	8,107	
August	1,189,714	1,193,878	191,727	232,680	81,326	74,364	326,475		1,162,230	1,468,335	15,342	
September	1,391,884	1,169,101	285,998	261,513	109,563	101,765	352,977		1,203,820	1,027,173	9,855	
October	1,345,971	1,252,723	338,480	271,598	121,704	123,949	344,242		1,461,782	1,315,752	18,626	
November	1,210,253	1,082,963	301,738	246,133	82,104	91,254	386,092		1,437,526	1,312,766	24,055	
December	1,054,662	1,151,581	259,506	255,832	83 373	71,154	307,214		1,255,494	1,111,530	12,412	
Total (Year)	13,220,020	12,719,606	2,785,861	2,658,051	928,969	852,982	3,324,952		13,036,497	12,266,859	229,047	
Total (Year) 1935	12,528,042	11,802,705	2,739,259	2,822,816	938,112	800,201	3,181,900		10,504,003	10,117,642	227,768	

* Source: Dept. of Commerce, Bureau of the Census. † Includes consumption in reporting company plants.

In each of the first 8 months of '37 production was greater than in the corresponding months of '36, but the totals for the final 4 months were in each case below those for the same months in the previous year.

Consumption of cellulose plastics received a decided impetus from the increase in automotive production in '37, both in the manufacture of laminated or "safety" glass and for the molding of a wide variety of interior fittings, such as door knobs, steering wheels, etc. Automotive production in '37 totaled 4,975,000 units, as compared with 4,487,147 in '36, and but 3,353,047 in '35. Outstanding developments in the plastics field in '37 were:—threat of the vinyl resins to cellulose acetate in the safety glass field; the large increase in the production of molded products made from cellulose acetate; the introduction of ethyl cellulose into the molding field.

Two plants are reported in the course of construction for the manufacture of polyvinyl acetal. It is claimed that greater elasticity at low temperatures as well as other favorable characteristics will aid this product in gaining a place of importance in the preparation of safety glass.

The manufacturers of all types of plastics have been devoting much of their sales efforts in recent years to the export trade. Final figures for '37 are still not available, but for the first 6 months the totals indicate that a big increase in the exports of cellulose plastics took place. Exports of film scrap amounted to 1,561,600 lbs., as compared with 673,300 in the first half of '36; pyroxylin sheets, rods and tubes jumped from 365,000 to 385,000 lbs.; cellulose acetate, sheets, rods and tubes rose from 202,000 lbs. to 530,000 lbs.

The immediate outlook in the automotive field being unfavorable, it is not likely that production and consumption of cellulose plastics, at least in the first few months of '38, will be as heavy in that industry as in the first quarter of '37. Despite the decided slump in consumption in the final months of '37 the price structure of cellulose plastics remained quite stable.

Long range prognostications are difficult to make in the plastics industry for many reasons. In the first place the industry itself is comparably new. It was only 5 years ago that cellulose acetate became an important factor in the manufacture of safety glass; in 3 years the number of automotive manufacturers using cellulose acetate molded products has more than doubled. In the second place, the technical developments are following with such bewildering rapidity that it is not safe to say that any field belongs to any one product indefinitely.

U. S. Chemical Patents

Off. Gaz.—Vol. 487, No. 2—488, Nos. 1, 2, 3—p. 17

Agricultural Chemicals

Method oxidizing lower oxides of phosphorus. No. 2,107,857. Paul H. Emmett, Washington, D. C., to Henry A. Wallace, Secretary of Agriculture of the U. S.

Volatilizing and oxidizing solid or liquid elemental phosphorus from crude mixtures containing the same. No. 2,110,870. Harry A. Curtis, Knoxville, Tenn.

Method increasing citrate-soluble phosphate content of fluo-apatite. No. 2,111,532. Johnson Hagood, Bartow, Fla., to Southern Phosphate Corp., corp. of Del.

Apparatus

Apparatus for decolorizing or desulfurizing hydrocarbons. No. 2,107,354. James M. Wadsworth, Tulsa, Okla.

Apparatus for producing and storing oxygen. No. 2,107,797. Adolf Messer, Frankfort-am-Main, Germany.

Apparatus for purifying liquids by flocculating impurities and subsequent floc sedimentation. No. 2,108,021. William S. Russell, Salem, Va., to Dorr Co., New York City.

Cellulose

Manufacture nitrocellulose impregnated under pressure with an alkali-metal soap. No. 2,108,001. Walter Durgin Bowlby, Meriden, N. H.

Preparation non-corrosive organic derivatives of cellulose, using an oxidizing agent in treatment. No. 2,109,496. Herbert E. Martin and Dorsey A. Ensor, Cumberland, Md., to Celanese Corp. of America, corp. of Del.

Method reducing corrosive action and otherwise improving properties of an organic derivative of cellulose, treating same while in secondary solution with solution capable of liberating chlorine. No. 2,109,509. Geo. Schneider, Montclair, N. J., to Celanese Corp. of America, corp. of Del.

Organic ester of cellulose which is free from corrosive action; adding weak organic acid to a ripened esterification solution of the organic ester of cellulose, and treating resulting solution with another agent. No. 2,109,753. Geo. Schneider, Montclair, N. J., to Celanese Corp. of America, corp. of Del.

Preparation of an alkyl ether of cellulose; reacting cellulose with an alkylating agent and an alkali in presence of a lower monohydric aliphatic alcohol. No. 2,110,526. Eugene J. Lorand to Hercules Powder Co., both of Wilmington, Del.

Treatment cellulose and cotton materials; subjecting same to an aqueous solution made from copper sulfate, ammonia, caustic soda, and water. No. 2,111,531. William H. Furness to American Rayon Co., both of Riverton, N. J.

Manufacture cellulose from wood, first treating wood with an aqueous nitric acid, then subjecting same to a two-stage treatment with an alkali. No. 2,110,545. Henry Dreyfus, London, England.

Production cellulose and cellulosic products. No. 2,110,546. Henry Dreyfus, London, England.

Two-stage process for manufacture of aliphatic esters of cellulose. No. 2,110,642. Harold Allden Auden, Banstead, and Hanns Peter Staudinger, Epsom, England, to Ernst Berl, Pittsburgh, Pa.

Dye-susceptible colloidized cellulose ester product, comprising organic acid ester of cellulose which has been hydrolyzed to an acyl content of 1¾ to 2¼ acyl groups for every C_6 unit of cellulose. No. 2,110,886. Carl J. Malm and Charles R. Fordyce, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.

Chemical Specialty

Liquid degreasing composition, comprising water-soluble "Tallol" soap, liquid hydrocarbon grease solvent, and alkali-metal phenolate. No. 2,107,287. Alton F. Curran to The Curran Corp., both of Malden, Mass.

Liquid composition for degreasing surfaces, composed of water-soluble soap, alkali in free, water-soluble condition and combined as phenolate, and liquid hydrocarbon grease solvent. No. 2,107,288. Alton F. Curran to the Curran Corp., both of Malden, Mass.

Bleaching artificial, animal, and vegetable fibers, by saturating them with bleaching solution comprising a high concentration of peroxide. No. 2,107,297. Hans O. Kauffmann to Buffalo Electro-Chemical Co., both of Buffalo, N. Y.

Insecticide composition. No. 2,107,298. Lowell B. Kilgore, Washington, D. C., to Kilgore Development Corp., E. Falls Church, Va.

Impregnating fibrous materials. No. 2,107,304. Izador J. Novak to Raybestos-Manhattan, Inc., both of Bridgeport, Conn.

Production valuable ester type lubricants, blending oils, and the like, from esters both fatty and non-fatty, saturated and unsaturated. No. 2,107,316. Peter J. Wiezevich, now by judicial change of name, Peter J. Gaylor, and Luther B. Turner, Elizabeth, N. J., to Standard Oil Development Co., corp. of Del.

Anti-fogging composition, consisting of glycerin, camphor gum, turpentine, potassium oxalate, and oxalic acid. No. 2,107,361. James T. Benton, Spokane, Wash.

Leaf spring liner comprising fibrous body, foliate mineral material embedded in the body, and a lubricant in solid form. No. 2,107,455. Tom H. Thompson, Detroit, Mich.

Re-surfacing and waterproofing compound, having following ingredients: coal tar, raw rubber, air-slacked lime, sugar of lead, and gasoline. No. 2,107,511. Charles Elbert Spooner, Arkansas City, Kans.

Manufacture granulated potassium fertilizers from potassium sulfate or sulfate of potassium and magnesium. No. 2,107,701. Karl Haase and Helmut Werth, Bleicherode, Germany, to Preussische Bergwerks-und Hutten-Aktiengesellschaft, Berlin, Germany.

Manufacture agglomerated potassium chloride fertilizer. No. 2,107,702. Karl Haase, Helmut Werth and Hermann Probst, Bleicherode, Germany, to Preussische Bergwerks- und Hutten-Aktiengesellschaft, Berlin, Germany.

Process sizing fabrics with water insoluble methyl cellulose which is dissolved by aqueous caustic soda at low temperatures; impregnating cotton fabric with solution containing methyl cellulose and caustic soda and final treatment with acetic acid. No. 2,107,852. Elmer K. Bolton to du Pont, both of Wilmington, Del.

Manufacture soda base grease; first saponifying fatty material and mixing with mineral oil. No. 2,108,016. Gus Kaufman, Beacon, N. Y., to Texas Co., New York City.

Production colored smoke; causing a chromate compound to react with chlorosulfonic acid. No. 2,108,019. Eberhard Neukirch, Bitterfeld, Germany, to I. G., Frankfort-on-the-Main, Germany.

Improved lubricant; comprising a mineral lubricating oil to which has been added an organic thioether of alpha-anthraquinone. No. 2,109,463. Troy Lee Cantrell and James Otho Turner, Lansdowne, Pa., to Gulf Oil Corp., Pittsburgh, Pa.

For use with a normal pressure sensitive sheeted binder coating an adhesive composed of glue, glycerin, calcium chloride, the residuum whereof is non-drying and water soluble. No. 2,109,471. Richard Gurley Drew to Minnesota Mining & Mfg. Co., both of St. Paul, Minn.

Lubricant composed of a hydrocarbon oil and a phosphonitrilic halide. No. 2,109,490. David Lipkin to Atlantic Refining Co., both of Phila., Pa.

Lubricant composed of a hydrocarbon oil and a condensation product of a phosphonitrilic halide with an organic compound. No. 2,109,491. David Lipkin to Atlantic Refining Co., both of Phila., Pa.

Manufacture laminated, aerated asbestos cement sheets. No. 2,109,532. Noel Arthur Hill, Camellia, near Sydney, Australia, to James Hardie & Co., Pty., Ltd., Sydney, Australia.

Sheet material comprising regenerated cellulose and a fibrous re-inforcing element impregnated with a metallic powder stiffening medium. No. 2,109,558. Harry F. Waters, assignor of a joint equal interest to V. N. Barrington, both of New York City.

Removal gloss from eggs by submerging them in solution of an acid and a wetting agent. No. 2,109,575. Clinton H. Parsons and Leon D. Mink to Industrial Patents Corp., all of Chicago, Ill.

Buoyant insect-exterminating element having superficial portion including insect-toxic ingredients, and a water-soluble binder for said ingredients. No. 2,109,642. Robert Hunt, Hackensack, N. J.

Rubber-cement composition in slurry or mortar form; mixture of cement and an emulsion of rubber in a solution of keratinous hydrosol and water glass, the water constituting the continuous phase. No. 2,109,662. Geo. Parry Davis, Bondi Beach, near Sydney, Australia.

Rubber-asphalt composition; rubber and asphalt emulsified with an aqueous keratinous hydrosol solution obtained by alkaline hydrolysis. No. 2,109,663. Geo. Parry Davis, Bondi Beach, near Sydney, Australia.

Neutral and stable copper fungicide; reaction product resulting from combining sodium carbonate with intermediate reaction product which results from combining copper sulfate and calcium hydroxide in presence of heat. No. 2,109,683. Frank J. Seibert to Chipman Chemical Co., Inc., both of Bound Brook, N. J.

Thickened lubricating oil; a mineral oil and a solid thickener produced by condensation of olefin and diolefin hydrocarbons. No. 2,109,772. Per K. Frolich, Roselle, N. J., to Standard Oil Development Co., corp. of Del.

Printing process; using an ink containing elaeostearin causing same to dry quickly by contacting ink with an auto-oxidation catalyst in form of a diacyl peroxide. No. 2,109,774. Franciscus Visser't Hooft to Lucidol Corp., both of Buffalo, N. Y.

Improved lubricating composition, a viscous petroleum fraction and zinc soap, and a corrosive sulfur compound dissolved in said oil. No. 2,109,779. Arnold J. Morway, New York City, to Standard Oil Development Co., corp. of Del.

Drilling fluid for heaving shale; an aqueous clay drilling mud containing a mixture of caustic alkali and an organic compound. No. 2,109,858. Geo. E. Cannon, Houston, Tex., to Standard Oil Development Co., corp. of Del.

Alkali cyanide zinc plating bath; comprising as addition agent methyl ethyl ketone preconditioned by concentrated sulfuric acid and neutralized with an excess of alkali. No. 2,109,887. Vincent Mattacotti to Hanson-Van Winkle-Munning Co., both of Matawan, N. J.

Preparation high quality lubricating oil from lubricating oil stocks. No. 2,109,895. John A. Anderson to Standard Oil Co., both of Chicago, Ill.

Flocculator composed of a fish oil, caustic potash solution, an alcohol, and water. No. 2,109,961. Errol Hay Karr to Yakima Valley Spray Co., both of Yakima, Wash.

Fungicide and wetting agent composition suitable for mildew-proofing organic fibrous materials; comprising isopropyl naphthalene sodium sulfonate, orthophenyl phenol, water, ethylene chlorhydrin, and ethyl alcohol. No. 2,110,074. Luther Bishop Arnold, Jr., to du Pont, both of Wilmington, Del.

Composite abrasive article, outer layer of very hard abrasive grain being bonded with a heat hardened synthetic resin. No. 2,110,143. Albert L. Ball, Lewiston, and Arthur G. Scutt, Niagara Falls, N. Y., to Carborundum Co., Niagara Falls, N. Y.

Extreme pressure lubricant comprising a mineral lubricating oil and a disulfide. No. 2,110,281. Elmer Wade Adams and George M. McNulty, Hammond, Ind., to Standard Oil Co., Chicago, Ill.

Adhesive composition comprising rubber hydrochloride and a reclaimed vulcanized rubber intimately admixed to form a dough, latter being dispersed in an organic solvent. No. 2,110,374. Herbert A. Winkelmann and Eugene W. Moffett, Chicago, Ill., to Marbon Corp., corp. of Del.

Method rendering wool textiles repellent to water; subjecting same to additional treatment in a soap solution. No. 2,110,383. Alexander Nathansohn to Studiengesellschaft fur Faserveredulung m.b.H., both of Berlin, Germany.

Self-emulsifying horticultural spray oil, adapted when mixed with water to provide a semi-stable emulsion capable of quickly breaking on being sprayed, comprising a hydrocarbon spray oil and an internal emulsifier. No. 2,110,398. Frank F. Lindstaedt, Oakland, Calif.

Insulating material comprising loose mass of nodules of intumesced sodium silicate. No. 2,110,470. Charles L. Norton, Boston, Mass.

Semi-solid upper cylinder lubricant which is completely soluble in motor fuel and has a lower apparent density than that of motor fuel due to occlusion in the lubricant of gaseous bubbles. No. 2,110,503. Alexander Duckham to Alexander Duckham and Co., Ltd., both of London, England.

Frictional composition comprising finely divided particles of soft metal held within a cellular matrix made of a solidified binder and iron oxide and carbon. No. 2,110,571. Arthur F. Elerath, Los Angeles, Calif.

Insecticide consisting of reaction products of nicotine and a readily water soluble petroleum hydrocarbon-sulfonate of ammonium. No. 2,110,608. Warren Moore, Richmond, and Robert B. Arnold, Henrico County, Va., to Tobacco By-Products and Chemical Corp., Louisville, Ky.

Insecticide having as its essential ingredient phenazine. No. 2,110,614. Donald L. Vivian and Herbert L. Haller, Washington, D. C., dedicated to free use of people of the U. S.

Abrasive wheel comprising body of abrasive grains united by a bond of shellac containing an insoluble fluoride. No. 2,110,630. Richard H. Martin to Norton Co., both of Worcester, Mass.

Continuous bleaching process; treating organic material with acid stabilized aqueous solutions of bleaching agents containing up to 3% of H_2O_2. No. 2,110,649. Ehrhart Franz, Leipzig, Germany.

Method inhibiting reaction capacity of ferro-manganese particles in a water paste of welding flux. No. 2,110,717. Jesse E. Sellers, Scotia, N. Y., to General Electric Co., corp. of New York.

Electrodeposition of silver; electrolyzing a silver cyanide bath containing thiourea as a brightener. No. 2,110,792. Birger Egeberg and Nathan Promisel to International Silver Co., all of Meriden, Conn.

Weed killing composition comprising a saturated chlorinated aliphatic hydrocarbon. No. 2,110,842. Ivan L. Ressler, Niagara Falls, N. Y., to du Pont, Wilmington, Del.

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Paving material consisting of graded pieces of mineral aggregate, each piece having a bituminous coating. No. 2,110,892. Samuel S. Sadtler, Springfield Township, Montgomery County, and Woolsey H. Field, Wyncote, Pa., to Bituvert Corp., corp. of N. J.

Insecticide having following formula: CH_3-R_1-N=N-R_2-OH. No. 2,110,896. Donald L. Vivian and Herbert L. J. Haller, Washington, D. C., dedicated to free use of Public in territory of the U. S.

Insecticidal compound of following formula: R-N=N-R_1-(OH). No. 2,110,897. Donald L. Vivian and Herbert L. J. Haller, Washington, D. C., dedicated to free use of Public in territory of the U. S.

Agricultural fungicide; reaction product of urea and a formaldehyde. No. 2,110,943. John Paul Remensnyder, Metuchen, N. J.

Abrasive article comprising abrasive grains and a solidified binder comprising a polymerized vinyl compound containing sufficient hydroxyl groups to be self-dispersible in water. No. 2,111,006. Norman P. Robie to Carborundum Co., both of Niagara Falls, New York.

Agricultural spray material; finely ground mixture of pasty consistency, comprising finely divided cuprous cyanide, a protective colloid, and water. No. 2,111,050. Paul La Frone Magill, Niagara Falls, N. Y., to du Pont, Wilmington, Del.

Production modified sodium silicate adhesive; adding zinc oxide to a sodium silicate solution. No. 2,111,131. Arthur S. Weygandt, Cleveland Heights, Ohio, to du Pont, Wilmington, Del.

Water-resistant composition, comprising an amylaceous material and a water soluble chromic salt of an aliphatic acid. No. 2,111,204. George V. Caesar to Stein Hall & Co., Inc., both of New York City.

Shoe counter comprising ply of fiber board secured to a ply of rubber-impregnated cellulosic material, having high flexibilty and resilience. No. 2,111,205. John B. Catlin, Appleton, Wis., to Paper Patents Co., Neenah, Wis.

Prepared foaming flux composition for use on a bath of molten metal; comprising a chloride flux and a foaming agent which contains a cinchona bark alkaloid nucleus. No. 2,111,226. Peyton R. Russell, Chagrin Falls, Ohio, to du Pont, Wilmington, Del.

Process of cleaning and pickling metals; subjecting metal to action of a dilute non-oxidizing acid in presence of an inhibitor having incorporated therein a cinchona bark alkaloid nucleus. No. 2,111,227. Paul L. Salzberg to du Pont, both of Wilmington, Del.

Manufacture abrasive articles, commingling a dry pulverized fusible reactive resin with a mass of abrasive granules previously coated with a sticky, tacky, resinous liquid, then subjecting mixture to cold molding and heat. No. 2,111,248. Emil E. Novotny to Stokes & Smith Co. (Durite Plastics Div.), both of Phila., Pa.

Inhibitor for chlorinated solvents: chlorinated aliphatic hydrocarbon containing tetramethyl piperazine. No. 2,111,253. Sylvia M. Stoesser and Francis N. Alquist to Dow Chemical Co., all of Midland, Mich.

Flexible abrasive article, comprising a flexible base, abrasive grains, and a bond for securing grains to base, bond comprising polyvinyl alcohol and an insolubilizing agent. No. 2,111,272. Paul M. Paulson, Lewiston, N. Y., to du Pont, Wilmington, Del.

Treatment cotton cloth, using dissolving solution made from copper sulfate, ammonia, and caustic soda, setting regenerated or partially regenerated cellulose, washing, drying, and subjecting to mercerizing treatment. No. 2,111,486. Samuel Bancroft Bird, Rockford, and Arnold Leroy Lippert, Wilmington, Del., to Joseph Bancroft & Sons Co., Wilmington, Del.

Manufacture cement; production slurry by adding a foam-generating substance to mixture of cement raw materials and water. No. 2,111,517. Mikael Vogel-Jorgensen, Frederiksberg, near Copenhagen, Denmark, to F. L. Smidth & Co., New York City.

Coal Tar Chemicals

Regenerative coke oven battery. No. 2,107,642. Charles V. McIntire, Short Hills, N. J., to Semet-Solvay Engineering Corp., New York City.

Preparation pentachlorophenol. No. 2,107,650. Frank B. Smith and John E. Livak to Dow Chemical Co., all of Midland, Mich.

Preparation 2,6-dimethylnaphthalene-1-sulfonic acid. No. 2,107,910. Willy Schumacher, Frankfort-on-the-Main, Germany, to General Aniline Works, Inc., New York City.

Preparation 1-methyl naphthalene-7-sulfonic acid and 1-methyl-7-hydroxynaphthalene. No. 2,107,911. Adolf Sieglitz, Frankfort-on-the-Main, Germany, to General Aniline Works Inc., New York City.

Preparation aralkyl ethers of substituted phenols. Nos. 2,109,456-7. Shailer L. Bass and Edw. M. Van Duzee to Dow Chemical Co., all of Midland, Mich.

Preparation aralkyl ethers of acyl-phenols. No. 2,109,458. Shailer L. Bass and Edw. M. Van Duzee to Dow Chemical Co., all of Midland, Mich.

Preparation aralkyl ethers of dialkyl phenols. No. 2,109,514. Edw. M. Van Duzee and Shailer L. Bass to Dow Chemical Co., all of Midland, Mich.

Regenerative coke oven. No. 2,110,373. Joseph van Ackeren, Pittsburgh, Pa., to Koppers Co., corp. of Del.

Chamber oven for production of gas and coke. No. 2,110,376. Heinrich Drehschmidt, Essen-on-the-Ruhr, Germany, to Koppers Co., a corp. of Del.

Continuous-vertical retort oven. No. 2,110,377. Wilhelm Fitz, Essen, Germany, to Koppers Co., corp. of Del.

Preparation nitro derivatives of 2-hydroxynaphthalene-3-carboxylic acid. No. 2,110,629. Wilhelm Luce, Hofheim-in-the-Taunus, Germany, to General Aniline Works, Inc., New York City.

Apparatus for wet concentration of coal by the float and sink process, using a heavy separating liquid. No. 2,110,760. Gerard Jan de Vooys, Huckelhoven, near Erkelenz, Germany.

Conversion carbonaceous and hydrocarbonaceous products into products of a low boiling point. No. 2,110,887. Michael Melamid, Zehlendorf, near Berlin, Germany.

Coatings

Oil-in-water emulsion for application to glass wool to produce an oleaginous coating, comprising a hydrocarbon, a fatty acid, a volatile alkaline agent, and water. No. 2,107,284. Hugh M. Bone and Robert C. Williams, Columbus, O., to Owens-Illinois Glass Co., Toledo, O.

Production opaque oxide coating having a milky white color, resistant to permanent staining by adsorption, on an aluminum surface. No. 2,107,318. Harold K. Work, Oakmont, and Martin Tosterud, Arnold, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Ductile cadmium coating; compound of cadmium, a cyanide compound, and an addition agent from the group of hydroxyaliphatic amines and the ether derivatives of alkylene glycols. No. 2,107,806. Karl Gustaf Soderberg and Henry Brown to Udylite Co., all of Detroit, Mich.

Production rubber coated sheet material having a colored enamel finish. No. 2,110,070. Russell Morgan, Drexel Hill, Pa., to du Pont, Wilmington, Del.

Mixed synthetic glyceride varnish; composition of asphalt and a mixed polyhydric alcohol ester containing acid radicals of mono-carboxylic acids. No. 2,110,072. Alfonso Miguel Alvarado to du Pont, both of Wilmington, Del.

Rapidly drying varnish containing a drying fatty oil, varnish solvent, and a resin; having less tendency to after-yellowing. No. 2,110,073. Alfonso M. Alvarado, Wilmington, Del., and Richard T. Ubben, Lakewood, O., to du Pont, Wilmington, Del.

Prevention frosting of films from a coating composition having as its vehicle a polyhydric alcohol-polybasic acid resin modified with a drying oil subject to frosting in the film. No. 2,110,085. Horace H. Hopkins, Springfield, Pa., to du Pont, Wilmington, Del.

Coating composition comprising rubber, shellac, chlorinated rubber, and a plasticizer. No. 2,110,539. Albert J. Weiss, Mineola, N. Y., to Vulcan Proofing Co., New York City.

Inhibition of varnish skinning; combination with an oleoresinous varnish of the polymerizable bodies of crude solvent naphtha in presence of a phenolic substance. No. 2,110,775. Joseph Rivkin, Pittsburgh, Pa., to The Neville Co., a corp. of Pa.

Manufacture sheet material, free from pinholes; in first step impregnating paper sheet with mixture including rubber hydrochloride, magnesium oxide, and a volatile solvent. No. 2,111,058. Herbert A. Winkelmann to Marbon Corp., both of Chicago, Ill.

Flash copper coating; subjecting ferrous article to a sulfuric acid solution of copper-sulfate which contains an organic acid-inhibitor. No. 2,111,199. Earl T. Alvord, Cleveland Heights, Ohio, to du Pont, Wilmington, Del.

Method preserving caustic soda of at least 50% concentration, in metallic containers, from contamination, by application to surfaces of films of a cellulose ether. No. 2,111,342. William F. Waldeck, Wadsworth, O., to Pittsburgh Plate Glass Co., corp. of Pa.

Production protective coating on an aluminum-silicon alloy. No. 2,111,377. Fred A. Wales, Detroit, Mich.

Resin film for coating beer and similar food products containers to prevent contamination, composition comprising a co-polymer of vinyl acetate and vinyl chloride admixed with chlorinated diphenyl resin. No. 2,111,395. Otto J. Hartwick, Milwaukee, Wis., to Pittsburgh Plate Glass Co., corp. of Pa.

Lacquer characterized by its capability of depositing a weather resistant, non-discoloring film, comprising cellulose acetobutyrate, a polymerized vinyl acetate synthetic resin and a solvent. No. 2,111,446. Walter E. Gloor to Hercules Powder Co., both of Wilmington, Del.

Protective and decorative coating composition productive of a hard durable film, having the characteristic of flow-back on heating, having as ingredients nitrocellulose, a terpene-maleic anhydride synthetic resin, and a solid plasticizer. No. 2,111,461. Fred K. Shankweiler, Kalamazoo, Mich., to Hercules Powder Co., Wilmington, Del.

Dyes, Stains, etc.

Manufacture carbocyanine dyes. No. 2,107,379. Robert Koslowsky, Dessau-Ziebigk, in Anhalt, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

Coloration of textiles, impregnating same with a liquid containing a leuco compound of a vat dyestuff. No. 2,107,526. Henry Dreyfus, London, England.

Method uniformly coloring colloids used in production of photographic materials including a light sensitive silver halide layer. No. 2,107,605. Bela Gaspar, Brussels, Belgium.

Production gray to black vat dyestuffs of the dibenzanthrone series. No. 2,107,656. Alexander J. Wuertz, Carrollville, and Ralph N. Lulek, Waukesha, Wis., to du Pont, Wilmington, Del.

Production azo compounds and process for dyeing. No. 2,107,898. James G. McNally and Joseph B. Dickey, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.

Production fast brown leather dyestuffs. No. 2,107,941. Fritz Hess, Karl Hager, and Walter Pense, Frankfort-on-the-Main-Hochst, Germany, to General Aniline Works, Inc., New York City.

Production compounds of the phenanthrene series. No. 2,109,518. Werner Zerweck and Karl Schutz, Frankfort-am-Main-Fechenheim, Germany, to General Aniline Works, Inc., New York City.

Production azo dyestuffs and their metalliferous derivatives. No. 2,109,552. Hans Schindhelm, Frankfort-am-Main-Fechenheim, Carl Theo Schultis, Bergen, near Hanau-am-Main, Gerhard Schrader, Opladen, near Cologne-am-Rhine, and Carl Taube, Leverkusen, near Cologne-am-Rhine, Germany, to General Aniline Works, Inc., New York City.

Production metalliferous azo dyestuffs. No. 2,109,806. Fritz Straub and Willi Widmer, to Society of Chemical Industry in Basle, all of Basel, Switzerland.

Production compounds of the benzofluoranthene series, which may be used as intermediates for production of dyestuffs. No. 2,109,833. Werner Zerweck and Karl Schutz, Frankfort-am-Main-Fechenheim, Germany, to General Aniline Works, Inc., New York City.

Vat dyestuff for use in printing textile fibres; comprising vat dyestuff, a compound from the class of anthraquinone sulfamic acids, water-soluble salts, and such reduction products as contain oxygen in the meso-position. No. 2,110,081. Richard Frank Goldstein and Simon Thomson McQueen, Blackley, England, and David Alexander Whyte Fairweather, Grangemouth, Scotland, to Imperial Chemical Industries, Ltd., London, England.

Process for dyeing leather with mono or disazo dyestuffs. No. 2,110,394. Ernst Fellmer and Hermann Noerr, Leverkusen-I. G. Werk, Gustav Mauthe, Cologne-Holweide, Germany, to General Aniline Works, Inc., New York City.

Method dyeing yarn with indigo. No. 2,110,595. Wilfred C. Foss, Greenville, N. H., to Otis Co., Ware, Mass.

Production water-insoluble azo dyestuffs. No. 2,110,694. Fritz Ballauf, Cologne-Holweide, and Otto Bayer, Leverkusen I. G.-Werk, Germany, to General Aniline Works, Inc., New York City.

Production sulfonium bases, obtained by acting with sodium sulfide on a chlorohydrine and treating mixture of high molecular aliphatic sulfurized compounds thus obtained with dimethylsulfate, being slightly colored viscous oils having property of improving fastness of dyes to water, perspiration, boiling acids and washing. No. 2,110,712. Ferdinand Munz, Frankfort-on-the-Main, and Karl Keller and Otto Trosken, Frankfort-on-the-Main-Fechenheim, Germany, to General Aniline Works, New York City.

Production vat dyestuffs of the anthraquinone series. No. 2,111,011. Berthold Stein, Mannheim, Germany, to General Aniline Works, Inc., New York City.

Production complex metal compounds of azo dyestuffs. No. 2,111,029. Friedrich Moll, Mannheim, and Fritz Lange, Ludwigshafen-on-the-Rhine, Germany, to General Aniline Works, New York City.

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Production dyestuffs and intermediates of the anthraquinone series. No. 2,111,074. William H. Lycan, South Milwaukee, Wis., to du Pont, Wilmington, Del.

Production anthraquinone compounds. No. 2,111,091. William Dettwyler, Milwaukee, Wis., to du Pont, Wilmington, Del.

Production dyestuff of the anthrimidecarbazole series. No. 2,111,092. William Dettwyler, Milwaukee, Wis., to du Pont, Wilmington, Del.

Production dyes of the polymethine series. No. 2,111,183. Isidor Morris Heilbron, Manchester, England, and Francis Irving, Grangemouth, Scotland, to Imperial Chemical Industries, Ltd., corp. of Great Britain.

Preparation water soluble addition compounds, containing sulfur, of alkyl or aralkyl halides. No. 2,111,260. Arnold Brunner, Frankfort-on-the-Main-Hochst, Germany, to General Aniline Works, Inc., New York City.

Production metalliferous azo dyestuffs. No. 2,111,270. Friedrich Moll, Mannheim, and Fritz Lange, Ludwigshafen-on-the-Rhine, Germany, to General Aniline Works, Inc., New York City.

Production monoazo dyestuffs. No. 2,111,300. Emil Senn, Riehen, near Basel, Switzerland, to J. R. Geigy S. A., Basel, Switzerland.

Preparation light-sensitive derivatives of vat dyestuffs. No. 2,111,479. Paul Ochwat, Frankfort-on-the-Main-Hochst, and Bruno Wendt, Dessau, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

Method treating surface of wood which has a natural fatty grain exposed; by application of a stain containing a mild acid to said surface. No. 2,111,494. Charles F. Preston, Sr., Harrison, N. Y., to Lignose, Inc., Mamaroneck, N. Y.

Explosives

Nitro-compound explosive mixture including a nitro derivative of naphthalene, an oxidizer, and an organic promoter. No. 2,110,220. Ingo W. D. Hackh, San Francisco, and James D. McLeod, Oakland, Calif.

Propellant powder; treating grains of propellant powder with a plasticizer to soften them. No. 2,111,075. Fredrich Olsen and Gordon C. Tibbitts, Alton, Ill., to Western Cartridge Co., East Alton, Ill.

Priming mixture containing fuel ingredient, a combustion initiating explosive, an oxidizing ingredient consisting of barium nitrate, and a catalyst. No. 2,111,203. Willi Brun, Bridgeport, Conn., to Remington Arms Co., Inc., corp. of Del.

Fine Chemicals

Preparation aromatic mercury substituted pyrazole in which the radical RHg—is linked to a substituted pyrazole. No. 2,107,321. Carl N. Anderson, Watertown, Mass., to Lever Brothers Co., corp. of Maine.

Method for continuous manufacture ethylene bromide. No. 2,108,011. Grayton F. Dressel, Wilmington, N. C., and Chas. E. Short, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Treatment photographic emulsion containing gelatin by the addition of glutathione. No. 2,110,178. Simon L. Ruskin to Frances R. Ruskin, both of New York City.

Preparation bismuth alkyl phthalates. No. 2,110,472. Geo. W. Raiziss and Le Roy W. Clemence, Phila., Pa., to Abbott Labs., No. Chicago, Ill.

Preparation bismuth salts of a monoalkyl polycarboxylate. No. 2,110,473. Paul L. Salzberg to du Pont, both of Wilmington, Del.

Sensitive photographic emulsion; dispersing a silver halide in a solution of a hydrolyzed cellulose organic acid ester. No. 2,110,491. Martti Salo, Rochester, N. Y., to Eastman Kodak Co., Jersey City, N. J.

Electrolytic recovery of silver contained in photographic fixing baths. No. 2,110,930. Henri Georges Doffin, Cholet, France.

Glass and Ceramics

Production silicic acid useful in manufacture ultra-violet transmitting glasses; treating finely divided raw materials containing titanic and iron oxides with sulfuric acid, subsequently washing treated materials with dilute sulfuric acid mixed with hydrogen peroxide. No. 2,107,935. Johann Ensz and Magdalene Huniger, Berlin-Charlottenburg, Germany, to General Electric Co., corp. of New York.

Laminated glass, glass sheet having bonded thereto a plastic sheet comprising cellulose nitrate and dibutyl hexahydrophthalate. No. 2,109,587. John W. Haught, Arlington, N. J., to du Pont, Wilmington, Del.

Low expansion glass composition: silica, boric oxide, lithia and at least one other alkali metal oxide. No. 2,109,641. Harrison P. Hood to Corning Glass Works, both of Corning, N. Y.

Industrial Chemicals

Treatment hydrocarbon vapors with zinc chloride, using also ammonium chloride in process. No. 2,108,438. Franklin E. Kimball, Los Angeles, Calif.

Preparation trifluoromethyl-phenylsulfides and their oxidation products. No. 2,108,606. Fritz Muller, Otto Scherer, and Willy Schumacher, Frankfort-am-Main, Germany, to General Aniline Works, Inc., New York City.

Preparation heterocyclic hydroxy compounds. No. 2,108,712. Ernst Herdieckerhoff, Opladen, near Cologne, and Eduard Tschunkur, Cologne-Mulheim, Germany, to I. G., Frankfort-am-Main, Germany.

Production 4-hydroxynaphthostyrile compounds. No. 2,108,879. Werner Zerweck, Wilhelm Kunze, and Walter Brunner, Frankfort-am-Main-Fechenheim, Germany, to General Aniline Works, Inc., New York City.

Sulfamic acid substance. Nos. 2,108,886-7. Fritz Guenther and Hermann Holsten, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Catalytic process preparing glycols, causing an oxide of olefine to react with water in presence of oxalic acid, then eliminating the oxalic acid. No. 2,108,936. Paul Ferrero, Tertre, Corneille Vandendries, Baudour, and Francois Berbe, St. Ghislain, Belgium, to Societe Carbochimique, Societe Anonyme, Brussels, Belgium.

Polycyclic phenolic condensation products. No. 2,109,015. Joseph B. Niederl and Victor Niederl, New York City.

Preparation derivatives of the anthrapyrimidine series. No. 2,109,116. Max Albert Kunz, Mannheim, and Karl Koeberle, Ludwigshafen-am-Rhine, Germany, to General Aniline Works, Inc., New York City.

Mercaptazole derivatives; obtained by reacting, with the elimination of water, a 1-mercaptazole in which the mercapto group is—SH, formaldehyde, and an ammonium sulfide. No. 2,109,158. Jan Teppema, Cuyahoga Falls, O., to Wingfoot Corp., Wilmington, Del.

Preparation furfuryl amines, hydrogenating in presence of a base metal hydrogenation catalyst, furfural and a solution of ammonia in an inert organic solvent. No. 2,109,159. Chas. F. Winans, Akron, O., to Wingfoot Corp., Wilmington, Del.

Preparation organic compounds containing ether and thio ether linkages. No. 2,107,366. Herman A. Bruson to Rohm & Haas Co., both of Phila., Pa.

Preparation polysulfonates of aromatic polyalkylene ethers. No. 2,107,367. Herman A. Bruson to Rohm & Haas Co., both of Phila., Pa.

Production sulfonation product of a hydrogenated abietyl halide. No. 2,107,508. Alfred L. Rummelsburg to Hercules Powder Co., both of Wilmington, Del.

Concentration organic acids. No. 2,107,527. Theodore Evans, Oakland, and Karl R. Edlund, Berkeley, Calif., to Shell Development Co., San Francisco, Calif.

Treatment cellulose esters of organic acids in form of loose granules or flakes or the like, and which contain acid used in esterification of cellulose to the cellulose esters, to remove esterification acid from cellulose ester. No. 2,107,537. John Edward Jones and David Robert Johnston, Spondon, near Derby, England, to Celanese Corp. of America, corp. of Del.

Preparation alkali metal salts of 2-benzoyl-benzoic acid compounds. No. 2,107,652. Otto Stallmann, So. Milwaukee, Wis., to du Pont, Wilmington, Del.

Catalyst for vapor phase hydrolysis of a chlorinated aromatic hydrocarbon, consisting of silica gel having absorbed in its pores a basic metal compound. No. 2,107,710. Ralph P. Perkins and Andrew J. Dietzler to Dow Chemical Co., all of Midland, Mich.

Preparation guanidino and biguanidino derivatives of cyclic ether compounds. No. 2,107,712. Bruno Puetzer, Albany, N. Y., to Winthrop Chemical Co., Inc., New York City.

Manufacture chlorhydrin; treating a non-benzenoid hydrocarbon containing the ethylene group -HC=CH- with a hypochlorite of a tertiary alcohol and water. No. 2,107,789. Charles G. Harford, Wollaston, Mass., to Arthur D. Little, Inc., Cambridge, Mass.

Method deodorizing plastic polymerized chloroprene; milling same in presence of an aliphatic monohydric alcohol. No. 2,107,796. Alexander D. Macdonald, Malden, Mass., to B. B. Chemical Co., corp. of Mass.

Preparation salt of ortho hydroxy quinoline. No. 2,107,856. Joseph Ebert, Westmont, N. J., to Farastan Co., Phila., Pa.

Separation liquid mixtures composed of aliphatic nitriles and liquid aliphatic hydrocarbons, subjecting mixture to action of a solid adsorbent. No. 2,107,904. William O. Pool to Armour & Co., both of Chicago, Ill.

Preparation chlorinated ketones of the general structure R-CO-R′, wherein R is an aryl radical and R′ a heptadecyl radical containing a chlorine substituent. No. 2,107,905. Anderson W. Ralston and Carl W. Christensen to Armour & Co., all of Chicago, Ill.

Manufacture alcohols from olefines by absorption in sulfuric acid. No. 2,109,462. Robt. E. Burk and Herman P. Lankelma to Standard Oil Co., all of Cleveland, O.

Improved method manufacturing organic thioethers of anthraquinone from alpha-anthraquinone. No. 2,109,464. Troy Lee Cantrell and James Otho Turner, Lansdowne, Pa., to Gulf Oil Corp., Pittsburgh, Pa.

Process of conditioning and re-use of mine bleed water in mining sulfur. No. 2,109,611. Bernard A. Axelrad, Freeport, Tex., to Freeport Sulphur Co., corp. of Del.

Partial oxidation of hydrocarbons. No. 2,109,700. Jos. Hidy James, Pittsburgh, Pa., to Clarence P. Byrnes, trustee.

Reducing composition; a viscous and pasty alkali metal sulfur salt composition. No. 2,109,708. Alfred Pfister, Englewood, N. J.

Process dehydrating trialkali orthophosphate. No. 2,109,811. Adolf Welter, Krefeld-Rheinhafen, Germany.

Production emulsions in which polyhydric alcohols partially esterified with fatty acids of high molecular weight are emulsified with water or aqueous solutions in presence of substances having an alkaline reaction. No. 2,109,842. Benjamin R. Harris, Chicago, Ill.

Catalytic hydrogenation of glycerides of aliphatic carboxylic acids, using a mild acting alcohol-forming hydrogenation catalyst. No. 2,109,844. Wilbur A. Lazier, Marshallton, Del., to du Pont, Wilmington, Del.

Nitration aromatic hydrocarbons in the vapor phase in presence of a silica gel catalyst. No. 2,109,873. Richard Herman Wilhelm, Princeton, N. J.

Partial alcoholysis of a polymeric ester of an acid, selected from group of acrylic and alpha hydrocarbon substituted acrylic acids, with an alcohol. No. 2,109,877. Harold James Barrett, Niagara Falls, N. Y., to du Pont, Wilmington, Del.

Production polymerized vinyl alcohol. No. 2,109,883. Willy O. Herrmann and Wolfram Haehnel, Munich, and Herbert Berg, Burghausen, Germany, to Chemische Forschungsgesellschaft, m.b.H., Munich, Germany.

Preparation aminocarboxylic acids. No. 2,109,929. Geo. W. Rigby to du Pont, both of Wilmington, Del.

Production guanidine nitrate; heating mixture of solid calcium cyanamide and solid ammonium nitrate to temperature within range of 110 to 170°C. No. 2,109,934. Harold M. Spurlin to Hercules Powder Co., both of Wilmington, Del.

Oxidation of alkyl pyridines and alkyl quinolines. No. 2,109,954. Chas. B. Biswell and Walter V. Wirth, Woodstown, N. J., to du Pont, Wilmington, Del.

Preparation acid amides. No. 2.109,941. Gaetano Francis D'Alelio, Dorchester, Mass., and Ebenezer Emmet Reid, Balto., Md., to du Pont, Wilmington, Del.

Preparation ester of a poly unsaturated aliphatic monocarboxylic acid with a saturated monohydric straight chain primary alcohol, said acid obtained by hydrolysis of a drying oil. No. 2,109,943. Geo. D. Graves, Wilmington, Del., and Raymond B. Thomas, Newburgh, N. Y., to du Pont, Wilmington, Del.

Preparation sulfamic acid; heating urea with chlorosulfonic acid. No. 2,109,952. Max Wyler, Blackley, Manchester, England, to Imperial Chemical Industries, Ltd., London, England.

Preparation pyridine-carboxylic acids and the like. No. 2,109,957. Miles A. Dahlen and Stanley R. Detrick to du Pont, all of Wilmington, Del.

Treatment wood-pulp and the like, using an oleaginous material in process. No. 2,110,032. Harrison R. Williams to International Paper Co., both of New York City.

Phenolic compounds; heating in presence of a dehydrating agent a phenolic compound and a branched-chain alcohol of at least 7 carbon atoms. No. 2,110,077. Merlin Martin Brubaker to du Pont, both of Wilmington, Del.

Production butyl alcohol and acetone by fermentation of a carbohydrate mash. No. 2,110,109. Elizabeth F. McCoy, Madison, Wis., to Commercial Solvents Corp., Terre Haute, Ind.

Metallic ortho-germanate activated by rhenium, having characteristic of becoming luminescent upon being excited by radiant energy. No. 2,110,161. Humboldt W. Leverenz, Collingswood, N. J., to Radio Corp. of America, corp. of Del.

Metallic ortho-germanate activated by a metal of the second sub-group of the first vertical column of the periodic system, having characteristic of becoming luminescent upon being excited by irradiations of radiant energy. No. 2,110,162. Humboldt W. Leverenz, Collingswood, N. J., to Radio Corp. of America, corp. of Del.

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Preparation ethyl chloride; reacting olefine-free ethylene with hydrogen chloride in presence of a catalyst initially supplied as solid iron oxide. No. 2,110,141. Walter E. Roush and Willard B. Morell, to Dow Chemical Company, all of Midland, Mich.

Production carbon tetrachloride by reaction carbon bisulfide with sulfur chloride under superatmospheric pressure of at least 1½ atmospheres. No. 2,110,174. John H. Reilly to Dow Chemical Co., both of Midland, Mich.

Recovery chromium content of chrome tan liquors containing chromium and organic solid matter. No. 2,110,187. Dudley A. Williams, Providence, R. I.

Preparation tertiary non-aromatic amines of the formula $CH_2{=}CH\text{-}C{\equiv}C\text{-}CH_2\text{-}X$, in which X is a radical which results upon the removal of the amino hydrogen from a secondary non-aromatic amine. No. 2,110,199. Wallace Hume Carothers, Arden, Del., to du Pont, Wilmington, Del.

Desulfurizing gases containing CO and H, passing gases at temperature between 100 and 300°C. in contact with an intimate mixture of a reactive oxide of iron and an alkali metal carbonate. No. 2,110,240. Otto Roelen, Mulheim-Ruhr, and Walter Feisst, Oberhausen-Holten, Germany to Studien- und Verwertungsgesellschaft m.b.H., Mulheim-Ruhr, Germany.

Manufacture sulfuric acid from petroleum acid sludge. No. 2,110,267. Paul J. Harrington, Westfield, and Harry G. Burks, Jr., Elizabeth, N. J., to Standard Oil Development Co., corp. of Del.

Reduction by electrochemical reaction of an aromatic nitro compound, insoluble in water, to a hydrazo compound. No. 2,110,273. Ralph H. McKee, New York City, and Charles J. Brockman, Athens, Ga., to Calco Chemical Co., Bound Brook, N. J.

Removal corrosive sulfur compounds from petroleum oils, first adding a water-free alcoholic solution of an alkali hydroxide to the oil. No. 2,110,283. Francis M. Archibald, Elizabeth, N. J., to Standard Oil Development Co., corp. of Del.

Multistage process of removing sulfur in organic combination from a gas mixture containing CO and H_2. No. 2,110,241. Otto Roelen, Oberhausen-Holten, Germany, to Studien- und Verwertungsgesellschaft m.b.H., Mulheim-Ruhr, Germany.

Recovery HCN from a dilute aqueous solution. No. 2,110,244. Frederick D. Schreiber, Dormont, Pa.

Preparation fluoro derivatives of hydrocarbons; reacting hydrogen fluoride in presence of a chromium halide with the vapor of a saturated halogen derivative of a lower aliphatic hydrocarbon. No. 2,110,369. Fred Davison Leicester, St. Helens, England, to Imperial Chemical Industries, Ltd., corp. of Great Britain.

Separation H_2S and gaseous mercaptans from gaseous hydrocarbons of less than 5 carbon atoms, by treatment with an aqueous solution of potassium phosphate. No. 2,110,403. Ludwig Rosenstein to Shell Development Co., both of San Francisco, Calif.

Separation mercaptans from a solution in a hydrophobe neutral organic solvent, by treatment with an aqueous saturated alkali metal hydroxide. No. 2,110,412. David Louis Yabroff and John Wilkinson Givens, Berkeley, Calif., to Shell Development Co., San Francisco, Calif.

Process absorbing traces of nitrogen oxides from the gas stream leaving the acid absorption system of a nitric acid plant, in final step removing, as a solution, the ammonium nitrite and ammonium nitrate formed. No. 2,110,431. Maarten Voogd, Beverwijk, Netherlands, to Shell Development Co., San Francisco, Calif.

Manufacture high molecular aliphatic alcohols. No. 2,110,483. August Guyer, Zurich, Switzerland, to Chemical Works formerly Sandoz, Basel, Switzerland.

Depolymerization of linear polyacetals. No. 2,110,499. Wallace H. Carothers to du Pont, both of Wilmington, Del.

Production dimer of an aliphatic polyhydric alcohol. No. 2,110,695. George W. Batchelder, Woodbury, N. J., to du Pont, Wilmington, Del.

Production diacetyl, leading a dilute acetylene gas mixture through a catalytic solution containing a strong oxygen-containing inorganic acid and its mercury salt. No. 2,110,699. Ernst Eberhardt and Friedrich Lieseberg, Ludwigshafen-on-the-Rhine, Germany, to I. G., Frankfort-on-the-Main, Germany.

Preparation of a zirconium oxycarbide and silicon carbide. No. 2,110,733. Charles J. Kinzie and Donald S. Hake, Niagara Falls, N. Y., to Titanium Alloy Mfg. Co., New York City.

Plumbite solution of high lead concentration, having its lead component held in solution by presence of an alkali-soluble compound of mercury. No. 2,110,745. Alexander Stewart, Roselle, N. J., to National Lead Co., New York City.

Treatment drying oils to body same for varnish and other uses. No. 2,110,780. Benjamin H. Thurman, Bronxville, N. Y., to Refining, Inc., Reno, Nev.

Process bleaching previously refined animal and vegetable oils which are free of free fatty acids. No. 2,110,789. Benjamin Clayton, Houston, Tex., and Benjamin H. Thurman, Bronxville, N. Y.

Production alcohols from petroleum. No. 2,110,816. Joseph J. Pelc, Chicago, Ill.

Production styrene and related compounds; pyrolyzing an alkylated aromatic hydrocarbon by mixing same with steam which has been superheated to supply heat of pyrolysis. No. 2,110,829. Robert R. Dreisbach to Dow Chemical Co., both of Midland, Mich.

Simultaneous production of vinyl-aromatic compounds and arylacetylenes. No. 2,110,830. Robert R. Dreisbach to Dow Chemical Co., both of Midland, Mich.

Production styrenes from vapors of aromatic hydrocarbons. No. 2,110,833. Hermann Mark, Mannheim, and Carl Wulff, Ludwigshafen-on-the-Rhine, Germany, to I. G., Frankfort-on-the-Main, Germany.

Hydrolysis of isopropyl chloride; reacting isopropyl chloride with a mixture of water and an alkali. No. 2,110,838. Edgar C. Britton, Gerald H. Coleman and Garnett V. Moore to Dow Chemical Co., all of Midland, Mich.

Catalytic hydration of olefines to alcohols. Nos. 2,110,878-9-80. Walter Philip Joshua, Cheam, Herbert Muggleton Stanley, Tadworth, and John Blair Dymock, Sutton, England.

Manufacture catalysis material for vapor phase hydration of olefines. No. 2,110,881. Walter Philip Joshua, Cheam, Herbert Muggleton Stanley, Tadworth, and John Blair Dymock, Sutton, England.

Treatment vinyl acetylene containing carbonyl impurities; bringing former into intimate contact with an aqueous solution of a water soluble bisulfite. No. 2,110,971. Albert S. Carter to du Pont, both of Wilmington, Del.

Preparation compounds of the triarylmethane series: 4:4′-diamino-2:2′-5:5′-tetra-alkoxy-triarylmethane. No. 2,110,973. Percy Thomas Gale and Wilfred Archibald Sexton, Blackley, Manchester, England, to Imperial Chemical Industries, Ltd., a corp. of Great Britain.

Core for electrical apparatus, comprising fibrous material impregnated with a phenol resin faced with a cellulose derivative, and a layer of fibrous material impregnated with a cellulose derivative adhered to said facing. No. 2,110,975. Fred E. Henderson, Riverside, Ill., to Western Electric Co., Inc., New York City.

Dehydrochlorination of 1,1,1,2 tetrachlorpropane. No. 2,111,043. Oliver W. Cass, Niagara Falls, N. Y., to du Pont, Wilmington, Del.

Cyclic process for recovery of selenium. No. 2,111,112. Horace C. Dudley, Springfield, Mo.

Process obtaining concentrated acetic acid from aqueous acetic acid. No. 2,111,140. Charles Coutor to Societe Anonyme: Establissments Lambiotte Freres, both of Premery, France.

Production mercapto compound of a metal from the group of gold, silver and bismuth, in which the metal-mercapto group is attached to an alicyclic radicle. No. 2,111,151. Eugen Mueller, Ludwigshafen-on-the-Rhine, Germany, to Winthrop Chemical Co., Inc., New York City.

Production stable hypochlorous acid solution. No. 2,111,194. Pedro Sanchez, Habana, Cuba.

Manufacture acetaldehyde by oxidation of ethyl alcohol. No. 2,111,208. Henry Dreyfus, London, England.

Preparation di-ethers of tetraethylene glycol. No. 2,111,234. Glenn F. Zellhoefer, Bloomington, Ill.

Recovery barium from black ash residues. No. 2,111,236. Robert W. Ball, Kaolin, Pa., to du Pont, Wilmington, Del.

Electrolysis of fused salts. No. 2,111,264. Harvey N. Gilbert, Niagara Falls, N. Y., to du Pont, Wilmington, Del.

Production nitrous oxide by thermal decomposition of ammonium nitrate. No. 2,111,276. James B. Castner and William E. Kirst, Woodbury, N. J., to du Pont, Wilmington, Del.

Reacting ammonium nitrate to form nitrous oxide. No. 2,111,277. James B. Castner and William E. Kirst, Woodbury, N. J., to du Pont, Wilmington, Del.

Method detecting presence of carbon monoxide; drawing gaseous mixture through a dry activated body comprising a colorless gas adsorbing gel impregnated with palladous chloride. No. 2,111,301. Gustav-Adolf Schroter, Dessau, Germany, to Otto Heinrich Drager, Lubeck, Germany.

Purification and concentration of sulfur dioxide obtained from acid sludge. No. 2,111,389. Henry F. Merriam, West Orange, N. J., to General Chemical Co., New York City.

Chemical process treating animal fibers. No. 2,111,391. Leo Frenkel, New York City, to Hatters' Fur Exchange, Inc., Walden, N. Y.

Process facilitating wetting of activated carbon with water. No. 2,111,436. Paul F. Pie, Jr., Newark, Del., to Darco Corp., Wilmington, Del.

Preparation alkali metal titanate; intimately mixing dry and pulverized artificially prepared titanium dioxide with dry and pulverized potassium hydroxide. No. 2,111,460. Joachim Rockstroh, Cologne-Deutz, Germany, to National Lead Co., New York City.

Production formaldehyde from carbon monoxide and hydrogen. No. 2,111,469. Jacques Francon, Paris, France.

Separation wax from an oil solution immiscible with said wax and having a higher specific gravity. No. 2,111,508. Leo D. Jones to Sharples Specialty Co., both of Phila., Pa.

Production esters of methacrylic acid. No. 2,111,509. Donald J. Loder to du Pont, both of Wilmington, Del.

Preparation methacrylic acid and esters. No. 2,111,510. Donald J. Loder to du Pont, both of Wilmington, Del.

Leather and Tanning

Tanning skins and hides which have been previously pickled; first using solution containing vegetable extract and alcohol, then drumming in an alkaline solution. No. 2,109,572. Geo. Freeman Lloyd, Brighton, Vict., Australia, to "Zetta" Pty., Ltd., So. Melbourne, Vict., Australia.

Manufacture product simulating leather; treating sheet material containing vulcanized rubber latex by a sulfur chloride dissolved in a neutral solvent. No. 2,109,911. Fernand Frederic Schwartz to Cela Holding, S. A., both of Paris, France.

Aqueous dispersion for tanning; product formed by adding to water a chrome tanning substance, a chrome tanning agent, and an acid, product being highly soluble and capable of rapid penetration into hide. No. 2,110,961. Matthew M. Merritt, Middleton, Mass., to Tanning Process Co., Boston, Mass.

Metals, Alloys, Ores

Recovery commercial tantalum from tantalum scrap. No. 2,107,277. Miner M. Austin, Highland Park, Ill., to Fansteel Metallurgical Corp., corp. of N. Y.

Production refractory metals and alloys. No. 2,107,279. Clarence W. Balke and Claire C. Balke, Highland Park, Ill., to Fansteel Metallurgical Corp., corp. of N. Y.

Method remelting and refining magnesium and light metal alloys containing magnesium. No. 2,107,282. Adolf Beck, Bitterfeld, Germany, to Magnesium Development Corp., corp. of Del.

Production alloy consisting of palladium, platinum, and gold. No. 2,107,310. Johann Simon Streicher to American Platinum Works, both of Newark, N. J.

Production iron powder from fine iron ores in a rotary reduction drum. No. 2,107,549. Hans Schmalfeldt, Cassel-Brasselsberg, Germany.

Concentration oxidized ores by froth flotation; carrying out in presence of reaction product of an alcoholic solution of alpha naphthylamine and phosphorus pentasulfid. No. 20,666. Reissue. Geo. H. Wigton, Eureka, Utah.

Impregnation of metals with silicon. No. 2,109,485. Harry K. Ihrig to Globe Steel Tubes Co., both of Milwaukee, Wis.

For use in filming aluminum foil for electrolytic condensers, a cathode comprising nickel, chromium, and iron. No. 2,109,634. Geo. W. Elsey, Dayton, O., to General Motors Corp., Detroit, Mich.

Elimination embrittlement and corrosion of pickled metal. No. 2,109,675. Constantine G. Miller, Oak Park, Ill., to Meaker Co., Chicago, Ill.

Process removing impurities from lead. No. 2,109,707. Berry M. O'Harra and Raymond L. Hallows, Joplin, Mo., to Eagle-Picher Lead Co., Cincinnati, O.

High speed alloy steel containing carbon, manganese, silicon, chromium, molybdenum, vanadium, and copper. No. 2,109,746. Alvin J. Herzig, Detroit, Mich., to Climax Molybdenum Co., corp. of Del.

Manufacture lead compounds. No. 2,109,755. Royal L. Sessions, Los Angeles, Calif., to Hughes-Mitchell Processes, Inc., Denver, Colo.

Filament for incandescent lamps; first mixing pure tungsten metal particles with tungsten particles coated with lower tungsten oxide film. No. 2,109,762. Shiro Abe, Nada-ku, Kobe, Kazuo Setoguchi, Motoyamamura, Muko-gun, Hyogo-ken, and Toyota Nagai, Suma-ku, Kobe, Japan, to Kabushiki Kaisha Kawanishi Kikai Seisakujo, Hayashida-ku, Kobe, Japan.

Treatment ilmenite ores for preparation of titanium dioxide pigments by hydrolysis of a solution containing titanium sulfate. No. 2,109,917. Holbert E. Dunn, Crafton, Pa., to Southern Mineral Products Corp., Bridgeville, Pa.

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Separation aluminum from beryllium in acid solutions of the two; precipitating all of the aluminum by addition of sodium hexametaphosphate. No. 2,110,010. Chas. F. White and Paul A. Parent, College Park, Md.

Production desulfurized pig iron. Nos. 2,110,066-7. Russell P. Heuer, Bryn Mawr, Pa.

Preparation basic silicates of the anhydrous alkali metal silicate type. No. 2,110,363. Lloyd T. Howells, Cleveland Heights, O., Alfred W. Scheidt, Sewaren, N. J., and Herbert B. Williams, Lockport, N. Y., to the Electric Smelting & Aluminum Co., Cleveland, Ohio.

Purification impure lead. Nos. 2,110,445-6. Ferdinand Leferrer to Societe Miniere et Metallurgique de Penarroya, both of Paris, France.

Treatment alumina-magnesia-chromite ore. No. 2,110,573. Albert E. Greene, Medina, Wash.

Method and apparatus for cutting and treating metals. No. 2,110,781. Robert L. Wagner, Astoria, N. Y., to Union Carbide and Carbon Corp., corp. of N. Y.

Corrosion-resistant and cold workable molybdenum steel. No. 2,110,891. Heinrich Reitz, Bitterfeld, and Erich Hengler and Alfred Buttinghaus, Wetzler, Germany.

Magnetic core of finely divided and insulated magnetic particles, particles comprising a pulverized nickel-iron alloy containing also copper. No. 2,110,967. John W. Andrews, Westfield, N. J., to Western Electric Co., Inc., New York City.

Manufacture magnetic nickel iron cores; using kaolin in process. No. 2,110,974. Randall Gillis, La Grange, Ill., to Western Electric Co., Inc., New York City.

Quench-hardened permanent magnet cobalt steel, comprising cobalt, carbon, silicon, manganese, chromium, tungsten, nitrogen, and iron. No. 2,111,005. Walter E. Remmers, Western Springs, Ill., to Western Electric Co., Inc., New York City.

Purification fused non-ferrous metal, using mixture of an alkali compound and a reducing agent. No. 2,111,032. Otto Nielsen, Ilsenburg at the Harz, Germany.

Electrical rectifier; rectifying couple comprising a copper sulfide element, a magnesium-manganese alloy element and a layer of manganese between said elements. No. 2,111,047. Carl Hambuechen, Belleville, Ill., to B-L Electric Mfg. Co., St. Louis, Mo.

Production ferrous alloy consisting of nickel, copper, chromium molybdenum and iron. No. 2,111,278. George Charlton, Battle Creek, Mich., to Eaton Mfg. Co., Cleveland, Ohio.

Manufacture metallurgical brick composed of a ferrous metal container, and a mixture of finely divided ferro-alloy and a metalliferous binder. No. 2,111,344. Joseph W. Weitzenkorn to Ohio Ferro-Alloys Corp., both of Canton, Ohio.

Reduction metalliferous materials by magnesium. No. 2,111,367. Gustaf Newton Kirsebom, Clifton, Bristol, England, to Calloy Ltd., London, Eng.

Production high strength corrosion resistant ferrous alloy sheets. No. 2,111,454. Victor H. Lawrence, Norristown, Pa., to Alan Wood Steel Co., corp. of Pa.

Electrolytic preparation of alkaline-earth alloys. No. 2,111,470. Robert Andre Gadeau, Saint Jean De Maurienne, France, to Compagnie de Produits Chimiques et Electrometallurgiques Alais, Froges et Camargue, Paris, France.

Paper and Pulp

Treatment paper stock to produce a parchment-like effect, conducting stock through bath of a solution of commercial grade zinc chloride in commercial forty per cent. grade formaldehyde. No. 2,107,343. Chester D. Rockwood and Kenneth L. Osmun to Union Selling Co., all of Cincinnati, O.

Manufacture sized paper having an alkaline filler, using plasticized resin as size. No. 2,109,931. James Carl Schmidt, Collingswood, N. J., to du Pont, Wilmington, Del.

Manufacture sized calcium carbonate filled paper. No. 2,109,944. Louis Leonard Larson to du Pont, both of Wilmington, Del.

Petroleum Chemicals

Purifying alcohols derived from unsaturated hydrocarbons, by removing oily impurities. No. 2,107,265. Francis M. Archibald, Elizabeth, N. J., to Standard Oil Co.

Hydrocarbon oil cracking process. No. 2,107,269. John B. Barnes to Universal Oil Products Co., both of Chicago, Ill.

Refining mineral oils. No. 2,107,291. Seymour W. Ferris, Aldan, Pa., to Atlantic Refining Co., Phila., Pa.

Process refining lubricant oil stock containing ingredients of low viscosity index, using reagent of aniline. No. 2,107,429. Bertrand W. Story and Vladimir A. Kalichevsky, Woodbury, N. J., Socony-Vacuum Oil Co., Inc., corp. of New York.

Conversion hydrocarbon oils. No. 2,107,454. Kenneth Swartwood to Universal Oil Products Co., both of Chicago, Ill.

Treatment emulsified hydrocarbons to demulsify same; incorporating therein naphthalene, sodium carbonate, and iron sulfate. No. 2,107,473. William E. Elliott, Youngstown, O.

Conversion hydrocarbon oils. No. 2,107,509. Jean Delattre Seguy to Universal Oil Products Co., both of Chicago, Ill.

Production hydrated olefines, directly hydrating olefine in presence of water and a metal salt. No. 2,107,515. Franklin A. Bent, Berkeley, Calif., to Shell Development Co., San Francisco, Calif.

Separation wax from mineral oil by filtration. No. 2,107,664. William Provine Gee, Plainfield, N. J., to Texas Co., New York City.

Process for extracting a liquid mixture to remove a component therefrom. No. 2,107,681. Willem J. D. van Dijck, The Hague, Netherlands, to Shell Development Co., San Francisco, Calif.

Refining mineral oil containing combined sulfur and gum-forming constituents, first subjecting oil to an incomplete acid treatment, then to action of chlorine under mild reacting conditions. No. 2,107,713. Herbert R. Rowland and Eugene Jerome Smith, Kansas City, Mo., to Corona Conversion Corp., corp. of Arizona.

Apparatus for refining mineral oils. No. 2,107,714. Herbert R. Rowland, deceased, late of Kansas City, Mo., by Mary U. Rowland, administratrix, Basking Ridge, N. J., and Eugene Jerome Smith, Ponca City, Okla.; Rowland and Smith to Corona Conversion Corp., Kansas City, Mo.

Process for dewaxing oil; by addition of a compound having a benzene ring nucleus adapted to accelerate rate of electrodeposition of wax. No. 2,107,770. Maner L. Wade, Long Beach, Calif., to Union Oil Co. of Calif., Los Angeles, Calif.

Process for dewaxing oil; by addition of an electrodeposition accelerator of the fatty acid group. No. 2,107,771. Maner L. Wade, Long Beach, Calif., to Union Oil Co. of Calif., Los Angeles, Calif.

Process for dewaxing oil, by addition an extraneous high molecular weight natural ester type wax. No. 2,107,772. Maner L. Wade, Long Beach, Calif., to Union Oil Company of Calif., Los Angeles, Calif.

Conversion hydrocarbon oils. No. 2,107,793. Lyman C. Huff to Universal Oil Products Co., both of Chicago, Ill.

Production alcohol from olefin hydrocarbons; treating olefin with a phosphoric acid solution to which has been added a metal oxide. No. 2,107,794. Vladimir Ipatieff and Vasili Komarewsky to Universal Oil Products Co., all of Chicago, Ill.

Separating and refining mineral oils containing paraffinic, naphthenic and aromatic portions by alternate use of a selective solvent in anhydrous and water saturated stages. No. 2,107,807. Hermann Suida and Hans Poll, Vienna, and Alfred Nowak, Modling, Austria.

Recovery and conversion of sulfur content of industrial gases, using an aqueous solution of K_3PO_4. No. 2,107,907. Ludwig Rosenstein to Shell Development Co., both of San Francisco, Calif.

Hydrocarbon oil treatment. No. 2,109,476. Seymour W. Ferris, Aldan, and Edwin R. Birkhimer, Phila., Pa., to Atlantic Refining Co., Phila., Pa.

Conversion hydrocarbon oils. No. 2,109,631. Chas. H. Angell to Universal Oil Products Co., both of Chicago, Ill.

Conversion hydrocarbon oils. No. 2,109,640. Jacob Benjamin Heid to Universal Oil Products Co., both of Chicago, Ill.

Qualitative chemical identification and control analysis. No. 2,109,645. Herman P. Lankelma to Standard Oil Co., both of Cleveland, O.

Manufacture sulfurized hydrocarbons. No. 2,109,692. Wm. E. Forney, Merchantville, N. J., to Power Patents Co., Hillside, N. J.

Improving anti-knock rating of a gasoline distillate containing normal paraffinic hydrocarbons. No. 2,109,866. Franz Rudolf Moser, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.

Treatment hydrocarbon oil. No. 2,109,875. Harold V. Atwell, White Plains, N. Y., to Gasoline Products Co., Inc., Newark, N. J.

Process stabilizing hydrocarbons. No. 2,110,274. Louis A. Mikeska, Elizabeth, and John B. Holtzclaw, Roselle, N. J., to Standard Oil Development Co., corp. of Del.

Decolorizing lubricating raffinate by extracting a viscous mineral oil with a selective solvent of the liquid sulfur dioxide type. No. 2,110,311. Monroe Edward Spaght, Martinez, Calif., to Shell Development Co., San Francisco, Calif.

Conversion hydrocarbon oils. No. 2,110,495. Charles H. Angell to Universal Oil Products Co., both of Chicago, Ill.

Solvent dewaxing and extracting of petroleum oils. No. 2,110,627. Eric B. Hjerpe, Pittsburgh, and William A. Gruse, Wilkinsburg, Pa., to Gulf Research and Development Co., Pittsburgh, Pa.

Process for breaking petroleum emulsions of the water-in-oil type. No. 2,110,837. Charles M. Blair to Tret-O-Lite Co., both of Webster Groves, Mo.

Treatment heavy hydrocarbon oils with light hydrocarbons. No. 2,110,845. James M. Whiteley, Roselle, and Gustav A. Beiswenger, Elizabeth, N. J., to Standard Oil Development Co., corp. of Del.

Processes for breaking petroleum emulsions of the water-in-oil type. Nos. 2,110,846-7-8-9. Melvin De Groote, St. Louis, Mo., to Tret-O-Lite Co., Webster Groves, Mo.

Electrical method for manufacturing sulfonated oils. No. 2,110,899. William Woelflin, Long Beach, Calif., to Petroleum Rectifying Co. of Calif., Los Angeles, Calif.

Manufacture stable paraffin; incorporating in paraffin an agent of the character of tetrahydroxybicyclospiroindan. No. 2,110,950. Robert E. Burk and Herman P. Lankelma to Standard Oil Co., all of Cleveland, Ohio.

Clear transparent motor fuel, comprising at least 50% of carbhydro base capable of being used in internal combustion engines. No. 2,111,100. Vaman R. Kokatnur to Autoxygen, Inc., both of New York City.

Production a yellowish-green fluorescence producing substance which is soluble in hydrocarbon oils. No. 2,111,126. Hans Rabe, Ludwigshafen-on-the-Rhine, Germany, to I. G., Frankfort-on-the-Main, Germany.

Treatment hydrocarbon oil. No. 2,111,222. William F. Moore, Bayside, N. Y., to Gasoline Products Co., Inc., Newark, N. J.

Cracking hydrocarbons such as for production of high grade anti-knock motor fuel. No. 2,111,223. Henry C. Pennrich, Brussels, Belgium.

Refining tall oil; oxidizing crude tall oil to render as much of the coloring material insoluble in gasoline as possible, finally distilling tall oil-gasoline to remove gasoline and odorous substances. No. 2,111,259. Helmer L. Blengsli, New York City.

Cracked hydrocarbon motor fuel of the type which tends to deteriorate on storage, containing as a stabilizer a sulfurized diaryl arylene diamine. No. 2,111,306. Thomas W. Bartram, Nitro, W. Va., to Monsanto Chemical Co., St. Louis, Mo.

Cracked hydrocarbon mineral motor fuel of the type which tends to deteriorate on storage, having incorporated therein a cyclohexyl naphthylamine. No. 2,111,307. Thomas W. Bartram, Nitro, W. Va., to Monsanto Chemical Co., St. Louis, Mo.

Conversion petroleum oils into gasoline-like products. No. 2,111,354. David G. Brandt, Westfield, N. J., to Power Patents Co., Hillside, N. J.

Separating liquid mixture of components into two portions. No. 2,111,360. Frank C. Cutting, Normandy, Mo., to Shell Development Co., San Francisco, Calif.

Conversion hydrocarbon oils. No. 2,111,401. Jacque C. Morrell to Universal Oil Products Co., both of Chicago, Ill.

Process for sweetening mercaptan-bearing petroleum oil. No. 2,111,487. Lovell V. Chaney and Albert E. Buell, Bartlesville, Okla., to Phillips Petroleum Co., corp. of Del.

Pigments, Dry Colors and Fillers

Manufacture calcium sulfate-zinc sulfide pigment. No. 2,111,137. James E. Booge, Newark, N. J., to du Pont, Wilmington, Del.

Manufacture pigment; grinding purified slurry of gypsum with zinc balls in presence of hydrogen sulfide. No. 2,111,379. Edward M. Allen, Barberton, Ohio, to Pittsburgh Plate Glass Co., Allegheny County, Pa.

Resins, Plastics, etc.

Bleaching alkyd resins, by incorporating in resin an acid of the group of citric, tartaric and oxalic. No. 2,107,610. Almon G. Hovey, Pleasant Ridge, Mich., to Helmuth Reichhold, doing business as Reichhold Chemicals, Detroit, Mich.

Preparation catalysts by coating a carrier with catalytically active material and a binder, then volatilizing binder. No. 2,107,611. Carl H. B. Jarl, Royal Oak, and Almon G. Hovey, Pleasant Ridge, Mich., to Beck, Koller & Co., Detroit, Mich.

Method and apparatus for making tubes of thermoplastic derivatives. No. 2,108,023. William Salemme, West Orange, N. J., to Celluloid Corp., a corp. of N. J.

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Synthetic resin, obtained by reacting cellulose with phenol in presence of an acid selected from the group of sulfuric and phosphoric. No. 2,109,466. Leon E. Champer, Vermilion, Ill., and Leo M. Christensen, Ames, Iowa, to Chemical Foundation, Inc., New York City.

Modified resin composition; polyvinyl acetal resin, using as modifier benzyl ether of ethyl lactate. No. 2,109,573. Barnard M. Marks, Arlington, N. J., to du Pont, Wilmington, Del.

Preparation batch of solid homogeneous plastic having a solid minor ingredient uniformly dispersed there-through. No. 2,109,592. Maurice L. Macht, Jersey City, and Alan F. Randolph, Montclair, N. J., to du Pont, Wilmington, Del.

Cellulose acetate molding compositions, comprising cellulose acetate and a mixed plasticizer consisting of camphor and a toughening exuding plasticizer. No. 2,109,593. Maurice L. Macht, Jersey City, and David A. Fletcher, Arlington, N. J., to du Pont, Wilmington, Del.

Molding composition comprising cellulose acetate and a mixed plasticizer consisting of camphor, triphenyl phosphate, and an aryl sulfonamide plasticizer. No. 2,109,594. Maurice L. Macht, Jersey City, N. J., to du Pont, Wilmington, Del.

Polymerization of organic chemicals, admixing a catalyst mixture of benzoyl peroxide and hydrogen peroxide with monomeric methyl methacrylate. No. 2,109,595. Barnard M. Marks, Arlington, N. J., to du Pont, Wilmington, Del.

Plastic composition comprising nitrocellulose, polymerized methyl methacrylate, and liquid lower di-alkyl phthalate as plasticizer. No. 2,109,599. Harold James Tattersall, Ardrossan, Scotland, to Imperial Chemical Industries, Ltd., London, England.

Preparation ether acid esters of higher alcohols; useful as plasticizers, etc. No. 2,109,947. Clayton Olin North to Margaret R. North, both of Charleston, W. Va.

Preparation polyvinyl esters; dispersing a saponifiable monomeric vinyl ester in an aqueous solution of a neutral reacting metal salt, then effecting polymerization. No. 2,109,981. Arthur Voss, Kurt Eisfeld, and Heinrich Freudenberger, Frankfort-am-Main, Germany, to I. G., all of Frankfort-am-Main, Germany.

Preparation resinous compositions. No. 2,110,042. Carroll B. Hall, Beaver Falls, and John D. McBurney, Newburgh, N. Y., and Edgar H. Nollau, Wilmington, Del., to du Pont, Wilmington, Del.

Plastic plug for use in plugging a wall, formed from mixture of fibres, powdered cement, and wheat flour moistened with water. No. 2,110,053. Noel Phillips, Bexleyheath, England.

Conversion condensation products made from urea, formaldehyde and hexamethylenetetramine and incapable of being hardened, into hardenable condensation products. No. 2,110,489. Wilhelm Kraus and Willi Fisch to Society of Chemical Industry in Basle, all of Basel, Switzerland.

Production resin having good film forming properties, high elasticity and good weather resistance, by reaction of a polyhydric alcohol, a reactive and soluble masticated Congo copal, a monobasic non-hydroxy carboxylic acid, and a polycarboxylic acid. No. 2,110,803. Wilhelm Krumbhaar to Helmuth Reichhold, both of Detroit, Mich., latter known as Reichhold Chemicals.

Manufacture plastic articles from pulverulent or granular masses. No. 2,111,418. Bertold Buxbaum, Berlin-Charlottenburg, Germany, to General Electric Co., corp. of N. Y.

Rubber

Method compounding rubber, by addition of a mixture of zinc stearate and another compound. No. 2,108,018. Thomas C. Morris, Akron, O., to Wingfoot Corp., Wilmington, Del.

Treatment natural and synthetic rubber; heating rubber in presence of an argillaceous catalyst and hydrogen, then separating treated rubber from catalyst. No. 2,109,495. Ernest M. Marks, Lansdowne, Pa., to Atlantic Refining Co., Phila., Pa.

Rubber emulsion capable of being coagulated by a water-hardening reagent; dispersion of rubber in an alkaline protalbinate solution in form of a keratinous hydrosol. No. 2,109,661. Geo. Parry Davis, Bondi Beach, near Sydney, Australia.

Manufacture sponge rubber. No. 2,109,676. Henry R. Minor to Industrial Process Corp., both of Dayton, O.

Rubber vulcanization; incorporating in rubber a vulcanizing agent, a basic accelerator and a compound. No. 2,109,698. Marion W. Harman, Nitro, W. Va., to Monsanto Chemical Co., St. Louis, Mo.

Rubber compositions; homogeneous mixture of vulcanized latex rubber, an unvulcanized pure gum, and a binder such as glue. No. 2,109,948. Robt. R. Olin, Akron, O., to Worthington Ball Co., Elyria, O.

Formation a strong tear-resistant product resembling vulcanized natural rubber; passing an electric current through a dispersion of chloro-2-butadiene-1,3 polymer containing an electrolyte and a salt of a water-soluble alkyd resin. No. 2,109,968. Arnold M. Collins to du Pont, both of Wilmington, Del.

Reacting rubber with a hydrogen halide in liquid spray form. No. 2,110,375. Herbert A. Winkelmann, Eugene W. Moffett and William C. Calvert, Chicago, Ill., to Marbon Corp., a corp. of Del.

Manufacture expanded rubber. No. 2,110,400. Frederick William Peel, Baltimore, Md., to Rubatex Prods., Inc., New York City.

Production solid chlorinated rubber products in cellular form by evaporation of the solvent from an emulsion containing a chlorinated rubber solution of viscosity not exceeding 4 c.g.s. units. No. 2,110,785. John Philip Baxter, Widnes, England, to Imperial Chemical Industries, Ltd., a corp. of Great Britain.

Treatment rubber; vulcanizing a rubber mix to which has been added diphenylguanidine and a product obtained by reacting a 2-mercaptobenzothiazole with ethyl chloroformate. No. 2,110,834. Ludwig Orthner, Leverkusen-on-the-Rhine, and Ewald Zaucker, Cologne-Mulheim-on-the-Rhine, Germany, to I. G., Frankfort-on-the-Main, Germany.

Rubberlike product; obtained by reacting a polymer of a vegetable oil completely heat-polymerized to the gelatinous stage and glycerol. No. 2,111,427. Harvey G. Kittredge to Kay & Ess Chemical Corp., both of Dayton, Ohio.

Textile, Rayon

Apparatus for spinning rayon. No. 2,107,451. Oskar Oppenlaender, Rome, Ga., to Tubize Chatillon Corp., New York City.

Renapping textile fabrics, moistening same with an emollient solution containing casein in suspension, rubbing with an abrasive, then cleansing fabric in a non-aqueous cleanser. No. 2,107,528. Benjamin G. Feinberg, New York City.

Production crepe effects on fabrics; fabricating highly twisted cellulose acetate yarns containing a calcium salt which is very soluble in water into a fabric, and treating with an aqueous medium. No. 2,107,657. Hans Altwegg and Armin Eichler, Freiburg, Germany, to du Pont, Wilmington, Del.

Production solid artificial thread, having lustre equal to or lower than natural silk, introducing a vaporizable high boiling hydrocarbon in a viscose solution, spinning, and finishing in such manner whereby hydrocarbon is eliminated. No. 2,107,668. William L. Hyden, Kenmore, and John S. Fonda, Buffalo, N. Y., to du Pont, Wilmington, Del.

Rendering wool material unshrinkable and non-felting product made thereby; reacting all fibres with sulfuryl chloride, resulting product having non-felting characteristics of air-dry wool which has been treated with a solution of sulfuryl chloride in an inert organic solvent. No. 2,107,703. Archibald John Hall, one-third to William Norton Hicking and one-third to Stephen James Pentecost, all of New Basford, Nottingham, England.

Method collecting wet spun filaments in a driven spinning pot. No. 2,107,758. Erich Knechtel, Sydowsaue, near Stettin, Germany, to No. American Rayon Corp., corp. of Del.

Production artificial fibroin thread, dissolving fibroin in an aqueous solution of an inorganic electrolyte, finally spinning said solution in a precipitating bath consisting of a concentrated aqueous solution of an easily water soluble salt. No. 2,107,959. Ernst Rossner and Karl Borner, Premnitz/Westhavelland, and Herbert Mahn and Wilhelm Irion, Dessau, Germany, to I. G., Frankfort-on-the-Main, Germany.

Process for winding on spools artificial filaments freshly extruded by the wet spinning process. No. 2,107,996. Kurt Schmidt, Wuppertal-Elberfeld-Greuze, Germany, to No. American Rayon Corp., corp. of Del.

Coagulating viscose by introducing same, in shaped condition, into a solution of a coagulating reagent. No. 2,109,591. Leon Lilienfeld, Vienna, Austria.

Reducing lustre of materials comprising organic derivatives of cellulose; by treatment with hot aqueous media in presence of a terpene alcohol. No. 2,111,225. Herbert Platt and Alvin W. Bergeron, Cumberland, Md., to Celanese Corp. of America, corp. of Del.

Production delustered rayon; having as delusterants, chlorinated diphenyl and petroleum. No. 2,111,449. James Willard Humphrey, Claymont, Del., and John Watson Pedlow, Chester, Pa., to American Viscose Corp., corp. of Del.

Manufacture artificial silk. No. 2,111,502. Arthur Reinhold Zart, Wuppertal-Barmen, and Alfred Maxton, Kassel-Bettenhausen, Germany, to North American Rayon Corp., New York City.

Water, Sewage Treatment

Treatment water to render it potable; intimately contacting it with a minor proportion of finely divided non-activated material of the group of pitch coke and oil coke. No. 2,107,765. Hugh Rodman, Oakmont, Pa., to Rodman Chemical Co., Verona, Pa.

Treatment sewage. No. 2,110,721. Anthony J. Fischer, Jackson Heights, N. Y., to The Dorr Company, Inc., New York City.